AN ORGANIZATIONAL AND EDUCATIONAL EFFECTIVENESS STUDY OF TEX-TECH ENTERPRISES

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AN ORGANIZATIONAL AND EDUCATIONAL EFFECTIVENESS

STUDY OF TEX-TECH ENTERPRISES

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SUMMARY

Organizational effectiveness is a relatively young area of behavioral science, apparently beginning in the early 1950's. Partially because of its age, researchers have not been able to develop standard measures and procedures to judge its attainment. Two general approaches exist to assess effectiveness; however, both have been severely criticized. Neither the goal approach nor the systems approach have been able to settle all the questions in the area. More recent research in the field has concentrated on developing a set of core variables, pertaining to all organizations, whose successful attainment would result in a high degree of effectiveness.

Tex-Tech Enterprises is a student operated company within the School of Textile Engineering. Since its beginning in January, 1973, no study had been undertaken to determine how effectively the organization is functioning.

The purpose of this study is threefold: 1) to review the literature in the area of organizational effectiveness to summarize, compare, and contrast the proposed approaches to the problem; 2) to evaluate the educational and organizational effectiveness of Tex-Tech; and 3) by using a simulated textile organization to introduce the concepts of organizational effectiveness to the textile industry in hopes some of the problems in the area might be solved.

The study was conducted during the period from June, 1975 to December, 1975. Results from interviews and specifically designed

CHAPTER I

INTRODUCTION

The present study is an evaluation of Tex-Tech Enterprises from the standpoint of educational and organizational effectiveness. The purpose of the study is threefold: first of all, to review the literature in the area of organizational effectiveness in order to summarize, compare, and contrast the proposed approaches to the problem; secondly, to evaluate the educational and organizational effectiveness of Tex-Tech Enterprises so that some of the organization's problems and possible solutions could be identified; and thirdly, by using a simulated textile organization to introduce the concepts of organizational effectiveness to the textile industry in hopes some of the problems in the area might be solved.

Organizational effectiveness is a macro approach to the assessment and functioning of organizations. Scientifically analyzing organizations from an effectiveness standpoint takes the total organization as its frame of reference. It views the organization as a total entity and focuses attention on the complete concept instead of one or several specific parts. Traditionally, such indicators as profits, sales, member satisfaction, and public image have been evaluated as specific measures which reflect the success of particular functions of the organization. Organizational effectiveness views all these specific measures in total, and reaches a performance assessment of the entire unit.

This is a relatively young area of scientific analysis, apparently beginning in the early 1950's. During that period, both researchers and businessmen saw a need for a way to measure the total performance of organizations. It was not sufficient to obtain production rates, net profit, or sales volume, and judge them separately. Additional measures were needed to evaluate other aspects of organizations such as turnover, job performance, and employee morale. In addition, methods were needed to combine all measures as they applied to the functioning of the complete organization.

With the introduction of these variables and needs, came the introduction of questionnaires to evaluate them. Hard variables such as production rate could be easily measured by consulting production records. However, these additional soft variables were not as easily evaluated. Their best indicator was organizational members opinions obtained through the use of questionnaires. By using properly designed questionnaires, a very accurate indication of such soft variables as morale and satisfaction could be obtained.

Although the problem was identified, its solution has not been an easy assignment. Considerable disagreement still exists among all concerned as what variables should be used as indicators of this total performance. Generally, the problem has been approached from the standpoint of either the goals of the organization or the organization's relationship with its environment. Both approaches, nevertheless, have been severely scrutinized. More recently, a trend has developed which attempts to judge performance in relationship to a set of core variables which are essential to effective organizational functioning. To date,

however, little agreement has been reached as to which variables should be included in this list.

Further, there is no such published account of any study of this type which has been conducted within any textile company. The applicability of this type research to textile operations is, therefore, questioned. It would not have been feasible, however, for the purposes of the present study to attempt to evaluate any profit-making textile company. Due to time limitations, lack of professional qualifications, complexity of large organizations, and required access to company records, acceptance of the study by any such company would have been rejected.

Tex-Tech was an organization which was both available and logical for the purposes of this study. Since its conception, no study had been undertaken to determine the educational or organizational effectiveness of the operation. As a result, several aspects of its functioning and value to participants had been questioned.

Tex-Tech is a student operated company within the School of Textile Engineering at the Georgia Institute of Technology. The idea for Tex-Tech was conceived during the summer of 1972 by Robert Hornbuckle, then a graduate student in the Textile School, and Professor Rick Porter, an Assistant Professor of the Textile School. Concern had developed over the inadequate laboratory portions of several academic courses offered to textile students. Those laboratories were criticized as presenting too little educational material for the three hours each was designed to cover. More effective utilization of the students time was the concern which resulted in the idea for Tex-Tech. After approximately five

month's preparation, Tex-Tech began operations in January, 1973, and has operated on a quarterly basis since that time.

Basically stated, Tex-Tech is a student operated company in which students of the textile school design, develop, manufacture, and market novelty textile products. The students enter the program either late in their freshman year or during their sophomore year at the operative level, and progress into different management roles during their junior and senior years. The program is designed so that members will work in several different areas to receive wide exposure to the operations of a textile firm.

The operation of the organization is divided into five divisions: Management Services, Yarn Production, Weaving, Knitting, and Finishing. Management Services is further divided into the departments of Personnel, Marketing, Accounting, Quality Control, Research and Development, and Industrial Engineering. Along with the operative level employees, there are also department heads for each department of Management Services, a divisional Vice-President for each division, a President, and an Assistant to the President. All management level members are elected to their positions.

The governing board of the company is the Board of Directors. This body is composed of the company President, the Assistant to the President, the divisional Vice-Presidents, an elected faculty advisor, and the Director of the Textile School. The Board of Directors establishes operating priorities and procedures for the organization.

Tex-Tech operates two three-hour shifts per week. Traditionally this has taken place on Wednesday afternoon of each week from 12 noon to 6 P.M.

Tex-Tech is a unique organization in many ways. The organization exists as a business company within an educational institution. As a result, it has characteristics of both fields. The operations are similar to those in the textile industry, however, production is only of secondary importance and no profit is realized due to sales. Tex-Tech functions with the education of its members in the areas of textile processing and management as its primary objectives.

Due to the unique nature of the company, most research in the area of organizational effectiveness did not directly apply. Such important problems to companies within the textile industry, as production, net sales, profit, and pay scale were not pertinent to Tex-Tech. In fact, some aspects considered as serious problems in the industry were basic to the operations of Tex-Tech, according to its design.

One such area is efficiency. Industry seeks maximum efficiency with minimal downtime of machinery. Tex-Tech, because of its educational nature, requires machinery to be used as a teaching aid. Although this results in low efficiency, it is a desired state.

Absenteeism and turnover are problems of major concern in the industry. In Tex-Tech, attendance of members during the operating times is mandatory, and turnover is a cornerstone to the theory behind Tex-Tech. The members of Tex-Tech are, theoretically, exposed to most aspects of the company. This results in almost complete turnover every three months.

Because Tex-Tech is not a business oriented organization, organizational records are kept at a minimal level. In fact, the only records

kept are personnel placement records; and even these are not kept up to date. This fact resulted in the inability to measure progress or relative effectiveness of the organization over time by using organizational records.

Data for this study were collected during the period from June, 1975 to December, 1975. During that time questionnaires were distributed and interviews conducted in an effort to establish the current state of affairs of the organization, its value to past members, and possible solutions to some of its problems. All possible data were analyzed statistically in an attempt to determine underlying problems which might exist.

The following survey reports the results of this study. Chapter II reviews pertinent literature in the area of organizational effectiveness. Chapter III presents the questionnaires used in the study, and their results. The interpretation and statistical analyses of the survey results are included in Chapter IV. Chapter V covers the discussion and recommendations of the study. An appendix following Chapter V includes tables of the statistical analyses.

CHAPTER II

LITERATURE REVIEW OF ORGANIZATIONAL EFFECTIVENESS STUDIES

Predicting the functioning and performance of organizations using scientific research methods is a relatively young area. Apparently during the early 1950's the initial attempts at assessing organizational effectiveness were undertaken. Due to its age and the inability to establish a standard procedure applicable to all types of organizations, considerable disagreement exists in the area. Such problems as the definition of organizational effectiveness, what variables and conditions determine organizational effectiveness, and which research methods are most appropriate to organizational effectiveness have been the source of much disagreement. The subsequent literature review presents these problems and the major attempts to solve them.

Early Research

In 1952, Bernard Bass, then of Louisiana State University proposed the ultimate criteria for determining organizational worth be expanded. Until this point, the success of organizations was evaluated by such "hard" measures as productivity, net profits, and the degree to which the organization accomplishes its mission as assigned by high authority. Bass suggested organizational success should be contingent upon such measures as "the worth of the organization to its

members and to society."[1]

Apparently the first investigation to determine organizational effectiveness using scientific research methods, and implementing these additional criteria were the U. S. Forestry Surveys later in 1952. A group of researchers from the University of Southern California used 18 United States Forestry Installations in California to study the factors influencing organizational effectiveness with the purpose of determining "how well the forests were accomplishing their objectives."[2] Questionnaires were mailed to different groups within the forestry administration in an attempt to determine how closely their opinions reflected the opinions of officials in the San Francisco Regional Office. Questions covered such areas as methods of supervision, administrative practices, and interpersonal relations. It was the attempt of the investigation to rank the forests on "the basis of how well they were functioning in comparison with what they ought to be doing."[3]

In 1953, a measuring device called the Employee Relations Index was introduced into several industrial firms on an experimental basis. "It was designed to measure the extent to which groups of employees accept and perform in accordance with the objectives of the company."[4]

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[1]Bernard M. Bass, "Ultimate Criteria of Organizational Worth," Personnel Psychology, 5 (1952), p. 157.

[2]A. L. Comrey, J. M. Pfiffaer, and H. P. Beem, "Factors Influencing Organizational Effectiveness," Personnel Psychology, 5 (1952), p. 308.

[3]Ibid., p. 309.

[4]Stanley E. Seashore, Assessing Organizational Performance with Behavioral Measurements (Ann Arbor, Michigan, Brown and Brumfield, Inc., 1964), p. 1.

These early attempts established the foundation for the area of behavioral science known as organizational performance or effectiveness. However, due to difficulties encountered in gaining acceptance, these early proposals got little further than the research stage.

In 1957 and 1958 substantial advances were made in the area of organizational effectiveness. Likert proposed new methods of measuring organizational performance, which included human aspects, were urgently needed before a true assessment of the organization could be made. Due mainly to recent advances in the social sciences, methods for evaluating such "soft variables" as loyalty, motivation, confidence, and trust could be used in conjunction with such "hard" end result measurements as productivity, sales, and profits to better assess an organization's effectiveness.

Georgopoulos and Tannebaum established what is considered to be the framework of current thinking in the area of organizational effectiveness when they proposed, in 1957, that effectiveness be "conceptualized as the extent to which an organization, as a social system, fulfills its objectives without incapacitating its means and resources, and without placing undue strain upon its members."[5]

Although these investigations and proposals aroused a great deal of interest, the area of organizational effectiveness remains today as "one of the most complex and least talked about problems in the study of social organizations."[6] The major difficulty arises from attempts to

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[5]Basil S. Georgopoulos and Arnold S. Tannebaum, "A Study of Organizational Effectiveness," American Sociological Review, 22 (1957), p. 540.

[6]Ibid., p. 534.

define the concept. Other main areas of disagreement arise from the association with diverse values and objectives. Also, from the fact researchers choose some a priori concept with which to measure effectiveness which seem theoretically correct but lacks practical application in more than one type of organization. Organizations, like most other entities, differ with type, functions, and objectives. The inability of researchers to establish criteria which cover this broad spectrum has been the source of many problems. "While emphasizing different aspects of the problem, all argue that results from studies of organizational effectiveness show numerous inconsistencies, and are difficult to evaluate and interpret, let alone compare."[7]

Data Selection Studies

Most research in the area of organization effectiveness has concentrated on the conditions for effectiveness, not the problem itself. A great deal of effort has been put into establishing types of criteria or variables to be used in effectiveness measures. Likert and Bowers propose a classification of variables to be used in the evaluation of organizations. The first group, causal variables, include policies, decisions, strategies, skills, and behavior. This group consists of independent variables that can be altered to influence developments, results, or accomplishments of the organization. They can be controlled by the organization's management. The second group, intervening variables, include performance goals, motivations, commitment to decisions, and collective capacity of members for effective action. Intervening

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[7]Stanley E. Seashore and Ephriam Yuchtman, "A System Resource Approach to Organizational Effectiveness," American Sociological Review 6 (1967), p. 892.

variables reflect the internal state and performance capabilities of the organization. The last group, end-result variables, include productivity, net income, costs, growth, and market share. These are the dependent variables that reflect the achievements or results of the organization. "One might visualize the relationship between the three classes of variables as stimuli (causal variables) acting upon the organism (intervening variables) and creating certain responses (end-result variables)."[8]

Seashore suggested a hierarchy of criteria to aid in the accounting of performance measures. The "ultimate criteria" is at the top of the hierarchy. It is the performance of the organization over the long run in achieving its formal objectives. This would include use of the organization's environment and resources to its greatest extent. In the middle of the hierarchy lie the penultimate criteria. These are short run standards and dimensions as determined by efficiency, sales volume, and growth rate, along with such behavioral variables as morale and satisfaction. The sum of these penultimate criteria determine the ultimate criteria. The current organizational functioning variables are at the bottom of the hierarchy. These are conditions which are associated with high achievement on each of the penultimate criteria, and are descriptive of the current organization as a system. Productivity against standards, meeting of schedules, machine downtime, absenteeism, turnover, and pride in the firm are examples of criteria which would fall into this class.

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[8]Paul Hersey and Kenneth H. Blanchard, Management of Organizational Behavior: Utilizing Human Resources (Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1972), p. 96.

Other research has dealt with types of data assessments to be used in measuring the effectiveness of organizations. These assessessments can be divided into two types: objective and subjective. "Measurement of objective data implies direct assessment of organizational properties without transformation through a human intermediary. Measurement of subjective data implies assessment indirectly by aggregation of individual perceptions of the organization's members."[9] For example, goals could be determined objectively by consulting the formal charter of the organization, or subjectively by asking members of the management their perception of the organizational goals.

Types of values to be used in organizational development programs in another area to receive attention. In his proposal of these values, Franklin divides them into two primary sets: Human Values and Science Values. Concerning Human Values, Franklin states:

> Those who most rely on the Human Values emphasize a basic goodness inherent in man. They stress that which is humanistic and optimistic. An emphasis on self-expression, self-determination, self-actualization, and a general concern for the individual is evident.[10]

The Science Values are not necessarily in opposition to the Human Values. They can be used collectively. When describing these values, Franklin writes:

> This second group relies on the Science Values that include the following: A positive value on objectivity, standard procedures, replicability and generalizability; a concern

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[9]Kerr Inkson, Ray Payne, and Derek Pugh, "Extending the Occupational Environment: The Measure of Organizations," Occupational Psychology, 41 (1967), p. 36.

[10]Jerome L. Franklin, Two Approaches to Organizational Development: A Conceptual Framework Based on Judgments of Valid Information (Washington, D.C., Journal Supplement Abstract Service, American Psychological Association, 1974), p. 2.

> for theory generation and testing based on empirical evidence; a belief in the utility of scientific knowledge; a distrust of impressionistic sources of information; a goal of an ever increasing body of knowledge.[11]

Leadership Studies

The area of leadership as a major determinant of effectiveness has been discussed frequently by a number of researchers. Bowers and Seashore, in a study of a major life insurance company, tested the relationship between leadership and effectiveness, and proposed their "Four-Factor Theory of Leadership" which would lead to improved effectiveness. Composed mainly from the combination of previous research in the area, these four dimensions are:

1. Support. Behavior that enhances someone else's feelings of personal worth and importance.

2. Interaction facilitation. Behavior that encourages members of the group to develop close, mutually satisfying relationships.

3. Goal emphasis. Behavior that stimulates an enthusiasm for meeting the group's goals or achieving excellent performance.

4. Work facilitation. Behavior that helps achieve goal attainment by such activities as scheduling, coordinating, planning, and by providing resources such as tools, materials, and technical knowledge.[12]

The authors found substantial support for their theory of leadership and effectiveness, however, concluded leadership was not adequate

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[11] Ibid., p. 3.

[12] Stanley E. Seashore and David G. Bowers, "Predicting Organizational Effectiveness with a Four-Factor Theory of Leadership," Administrative Science Quarterly, 11, (1966), p. 247.

by itself as a predictor for effectiveness. Such intervening factors as additional leadership variables, work patterns, and personal and motivational variables would need to be used in addition to the four leadership dimensions to predict effectiveness. The model is not one of a simple relationship of managerial leadership improving peer leadership which leads to improved output. Instead, it is a matrix of different leadership characteristics affecting different performance aspects. The study does, however, indicate a strong relationship between leadership style and performance of the organization.

Price, in 1973, in a somewhat different approach, tested the relationship of governing or decision-making boards to organizational effectiveness and morale. It was determined these boards, which act primarily as a buffer group between the staff of the organization and the public, or environment of the organization, had definite affects on the organization's performance and the morale of its members. Because of their political nature and status, they influenced effectiveness by increasing the reputation of the organization in the eyes of the public and by adding legitimacy to the major decisions made by the organization.

Training Group Studies

The use of training programs and T-groups for increasing organizational effectiveness are two other areas which have received attention from researchers. Hand and Slocum in a study of training programs and organizational development proposed training increases organizational performance by both giving members a foundation for training and growth

and "by making rewards and punishments from the organization contingent on the transfer of training to the job."[13]

Argyris argues that T (training) groups, when used in a laboratory setting, provide valuable exercises for individuals in understanding their own behavior, learning the nature of effective group functioning, and developing procedures which achieve specific group goals with minimum human cost. When these results are achieved, increased organizational effectiveness will result.

Two Approaches to Organizational Effectiveness

Although most of the research in the area has avoided a head-on confrontation with the problem of measuring organizational effectiveness, two general approaches have evolved: the goal approach and the system approach.

The goal approach, the older of the two, is based on the ideal that organizational effectiveness is determined by the degree to which an organization attains its goals. When using this approach, researchers make the assumptions organizations have ultimate goals or objectives toward which they are constantly striving; these goals can be identified; and measures of their attainment evaluated. The focus of the goal approach is on either the prescribed goals found in the organization's formal charter or the goals established by the top management in the organization. It is upon the attainment of these objectives that the effectiveness of an organization is measured.

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[13]Herbert H. Hand and John W. Slocum, Jr., "A Longitudinal Study of the Effects of a Human Relations Training Program on Managerial Effectiveness," Journal of Applied Psychology, 5 (1972), p. 416.

A derivative of the goal approach has been labeled the functions or functional approach. This method uses as its measure of organizational success the derived goals obtained on the part of the investigator. From his research and experimental results, the investigator arrives at organizational goals which might be "independent of the intentions and awareness of the members"[14] of the organization.

Due to its inability to develop a standardized procedure for assessing organizational effectiveness, the goal approach has received many criticisms. The majority of these criticisms stem from the interpretation of the organization's goals and from lack of attention to external factors affecting the organization.

The definition of goal has aroused questions concerning the goal approach. Supporters of this approach generally accept Etzioni's definition, "An organizational goal is the desired state of affairs which the organization attempts to realize."[15] This definition has been criticized because organizations have several goals and would, therefore, have several desired states of affairs. Some of these multiple goals might be in conflict with one another so that achievement of one would result in failure to achieve another.

The determination of the goals of an organization has also been scrutinized. The goal approach depends on the formal organizational charter, the top level management, or the results of an investigation

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[14]Seashore and Yuchtman, p. 892.

[15]James L. Price, Handbook of Organizational Measurement (Lexington, Massachusetts, D. C. Heath and Company, 1972), p. 101.

to determine what actually are the goals of the organization. Doubters of the approach feel biases will be encountered in using either of these resources. The interpretation of the formal charter or investigation results is dependent upon the researcher's opinions. Also, managers' feelings toward organizational goals will most definitely reflect which department they supervise or what areas they feel are most important to the success of the organization. Therefore, the realization of the actual goals is doubtful.

The fact there exists many different kinds of organizations have lead several researchers to abandon the goal approach. Scientists hope a standard procedure, applicable to all organizations, can be found to assess effectiveness. It is very doubtful this can be done using the goal approach.

The goal approach does not account for external factors in its methodology. Since organizations are never completely isolated from their environment, several researchers discredit the use of the goal approach. They feel the success of the organization is directly related to its changing environment; and it must depend strongly on its environment for the resources which will make the achievement of goals possible. Because of its failure to account for these external factors, the goal approach is often called the closed approach.

Etzioni points to another shortcoming of the goal approach. He states goals exist as ideal states. When goal attainment is used as the single criterion for organizational effectiveness, an ideal state is compared to the deficiencies of reality. This leads to predictable results when using the goal approach: "(a) that the organization does

not realize its goals effectively and/or (b) that the organization has different goals from those it claims to have."[16]

Although goals have been severely criticized as criteria of effectiveness, they do have several merits. First of all, objectives must be established in order to give the organization a purpose. Even though they may never be completely attained, these objectives are necessary criteria for performance. Also, goals reflect the desired state of affairs which every organization should strive to reach.

Due to the inadequacies of the goal approach, Seashore and Yuchtman designed the systems resource approach to organizational effectiveness. They define effectiveness of the "bargaining position" of the organization in relation to resources and competing social entities which share all or part of the organizational environment. The greater the ability of the organization to exploit its environment for the acquisition of scarce and valued resources, the greater its effectiveness. The main focal point of this approach is on the general capability of the organization as a resource-getting system instead of the degree of goal or objective achievement. Because of its dependence on external factors, the systems approach is often referred to as the open system.

The major shortcoming of this approach is its comparative nature. It is most useful when characteristics of two organizations or of one organization at two different points in time are compared to determine

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[16]Jaisingh Ghorpade, Assessment of Organizational Effectiveness: Issues, Analysis, and Readings (Pacific Palisades, California, Goodyear Publishing Company, Inc., 1971), p. 34.

which alternative is more effective. Due, also, to its comparative nature, this approach indicates the lack of a universal standard in determining organizational effectiveness. Rather, it suggests effectiveness is an issue that must be handled organization by organization or, at least, by types of organizations.

In addition, the study of an organization using the systems approach would be more time consuming, and thus, more expensive. Because more research and evaluations are needed than just the measurement of goal attainment, many researchers feel the systems approach is undesirable.

The nature of the systems approach gives insufficient emphasis to productivity. Since production, in one form or another, is a major function of any organization, several researchers believe this to be the major criticism of the systems approach.

However, the systems approach suggests solutions to many of the problems associated with the goal approach. Proponents of the systems approach feel it allows much more flexability to the structure of the organization's changing environment. The emphasis of the systems approach is on adaptability, rather than productivity, as with the goal approach.

The systems approach has been conceptualized as a never ending input-output cycle of the organization and its environment. The organization obtains resources from its environment, processes these resources, and returns them, in a different form, to the environment. The survival of the organization depends upon the nature and quality of its input resources, and the acceptance of its output by the environment. This

is in direct contrast to the closed system which concentrates solely on outputs. Many researchers feel the input-output characteristics of the systems approach give a much more adequate explanation of the functioning organization.

When comparing the two approaches, Hall[17] makes a unique observation. He suggests the differences of the two approaches is a problem of semantics. The inputs or resources of an organization are determined by the ultimate goals of the organization. The processes for changing and returning these resources to the environment depend upon other goals of the organization. He maintains the criteria used in the Seashore and Yuchtman approach are actually types of organizational goals.

Hall subdivides organizational goals into official and operative goals.

> Official goals are the general purposes of the organization at put forth in the charter, annual reports, public statements by key executives and other authoritative pronouncements. Operative goals, on the other hand, designate the ends sought through the actual operating policies of the organization; they tell us what the organization actually is trying to do, regardless of what the official goals say are the aims.[18]

Hall suggests that organizational effectiveness be assessed in terms of these operative goals, which depend upon successful acquisition and maintenance of environmental support.

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[17]Richard H. Hall, Organizations: Structure and Process (Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1972) pp. 98-100.

[18]Ibid., p. 83.

More Recent Studies

Although the systems approach meets requirements the goal approach does not, an adequate universal standard for assessment of effectiveness has not resulted from either approach. Because of this, more recent studies have attempted to define an approach which would adequately measure the effectiveness of all types of organizations.

Mott proposed effectiveness could be evaluated in terms of an organization's productivity, adaptability, and flexibility. "Effective organizations are those which produce more and higher quality outputs and adapt more effectively to environmental and internal problems than do other, similar organizations."[19] This is actually a combination of the goal and systems approach. It is essential for an organization to attain its productivity goal, however it must also adapt to its constantly changing environment and be flexible enough to adjust to any internal problems which arise. Mott's approach, like the systems approach, is of a comparative nature.

Caplow's study[20] was another which was of a comparative nature. He suggested organizational effectiveness of two organizations or of a single organization at different points in time could be compared in terms of four variables:

1) Stability or the ability of the organization to maintain and develop its structure.

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[19]Paul E. Mott, The Characteristics of Effective Organizations (New York, Harper and Row, 1972) p. 17.

[20]James L. Gibson, John M. Ivancevich, and James H. Donnelly, Jr., Organizations: Structure, Processes, Behavior (Dallas, Texas, Business Publications, Inc., 1973), pp. 30-31.

2) Integration or the ability of the organization to avoid conflict among its members.

3) Voluntarism or the ability of the organization to provide and maintain satisfaction of its members.

4) Achievement or the result of all activities within the organization.

Caplow feels the basic problem to an organization's effectiveness is its ability to maintain and increase these four variables.

Gibson et al.[21] proposed a model for effectiveness which incorporates the element of time with such other criteria as production, efficiency, satisfaction, adaptiveness, and development. Their approach is based on the input-output characteristic of the systems approach, in which an organization obtains, processes, and returns resources to its environment over a period of time. In the short run, the organization's objectives would be production, efficiency of operations, and satisfaction of its members. Over the long run, the organization's only objective is survival. Intermediate of these two extremes are such objectives as the organization's ability to adapt to both internal and external change and its development so that it can survive. By introducing time as a major variable, it is possible to evaluate effectiveness in the short, intermediate, and long run.

Perhaps the most extensive study of organizational effectiveness was conducted by Price[22] in 1968. He used the Likert and Bowers' model

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[21] Ibid., pp. 36-40.

[22] James L. Price, Organizational Effectiveness: An Inventory of Propositions (Homewood, Illinois, Richard D. Irwin, Inc.).

of causal, intervening, and end-result variables to assess effectiveness. This model might be considered simply a modification of the goal approach. However, it does deserve special attention.

Price defines effectiveness as the dependent, or end-result variable which is contingent on several independent or causal variables. Price's causal variables increase or decrease effectiveness by affecting a set of core or intervening variables. Included in these intervening variables, which are essential for an organization to operate effectively are:

1) Productivity, or the quantity and quality of output in relation to input.
2) Conformity, or the degree to which the members accept the standards and norms of the organization.
3) Morale, or the degree of satisfaction of the members.
4) Adaptiveness, or the extent to which the organization can respond to internal and external changes.
5) Institutionalization, or the degree to which the organization gains acceptance by its environment.

It is generally accepted these five variables have a definite bearing on the degree of effectiveness an organization obtains. In presenting his causal variables, Price describes how they affect these intervening factors.

For the purpose of presenting his causal variables, Price views an organization as consisting of four separate systems: economic, political, control, and population-ecology. Each of these systems have factors which lead to both system and organizational effectiveness.

1. The economic system consists of those components which are directly involved with the production of output. Economic systems which are most likely to result in a high degree of effectiveness are those that obtain high degrees of:

   (a) division of labor;

   (b) task allocation to interdependent departments;

   (c) dependence on sources other than human energy for producing output;

   (d) a method of production which is continuous as opposed to batch assembly.

2. The political system consists of those components of the organization which makes decisions and attempts to achieve environmental acceptance to those decisions. The making of decisions refers to the internal political system. The type of internal political system most likely to result in a high degree of effectiveness is:

   (a) one which allows decision making only in accordance with roles;

   (b) one which realizes a high degree of socially approved behavior;

   (c) one which places the majority of both day-to-day and long-term decisions on specific members. With respect to long term decisions it is desirable to have a single member make the decisions.

The external political system consists of those components which attempt to gain external or environmental acceptance to organizational

practices and decisions. The types of external political system most likely to result in a high degree of effectiveness are those which have high degrees of:

(a) freedom to make decisions with respect to the environment;

(b) publically expressed beliefs which are compatible with the environment;

(c) publically expressed beliefs which are held in high esteem by the environment;

(d) publically expressed beliefs which correspond to environmental norms;

(e) recruitment of outside members in order to increase institutionalization.

3. Control systems are defined as components which motivate members to conform to organizational norms. The type of control system most likely to result in a high degree of effectiveness are those that obtain high degrees of:

(a) sanctions, or feedback to members in accordance with their role performance;

(b) relationships between members who must enforce regulations and members who must abide by these regulations which are specific, impartial, and focus on achieved, rather than ascribed, criteria;

(c) sanctions which depend upon service to the organization and based upon group output;

(d) effective communications both among peers and in the superordinate-subordinate relationship.

4. Population - Ecology Systems, unlike the other systems are not patterns of interaction. In regard to this system, organizations are more likely to have a high degree of effectiveness if they have a high degree of:

(a) size, or "the volume of output produced and distributed"[23] by the organization;

(b) relocation of members from one location to another.

The relationship between these causal variables, the set of intervening variables, and effectiveness is illustrated in Figure 1.

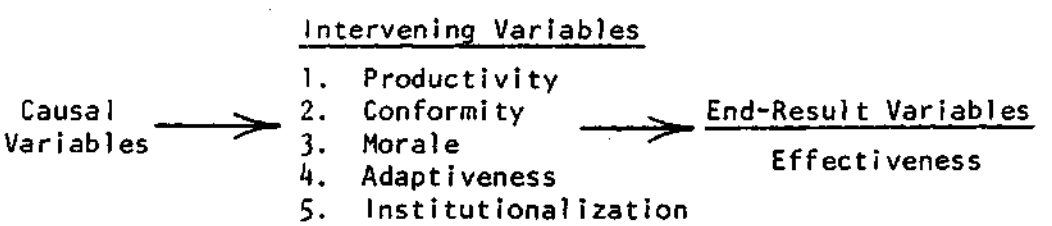

Figure 1. Schematic Representation of Price's Approach to Organizational Effectiveness.

Summary

Early research reflected the need for the use of scientific methods to determine the performance of organizations. These early approaches lacked sufficient support to be seriously considered as offering solutions to the problem. However, they did pave the way for later developments.

The first study of organizational effectiveness to merit much attention was Georgopoulos' and Tannebaum's research of an industrial

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[23] Ibid., p. 185.

service organization in 1957. The authors established the lines of thinking which are still explored today by proposing effectiveness be viewed as a composite of an organization's output and the means through which it attains these ends.

Much effort was put into the area of variables and criteria which reflect effectiveness. Such work as that by Likert, Bowers, and Seashore established classification systems for the determinants of organizational effectiveness, without attacking the problem of measurement.

From this earlier research, two approaches to the measurement of effectiveness evolved. The goal approach concentrated on the attainment of objectives as the major indicator of effectiveness, while the systems approach viewed effectiveness as the organization's ability to exploit its environment for resources. Both approaches have been questioned and criticized because of their lack of relevance to all types of organizations and their inability to establish standardized procedures for assessing effectiveness.

The emphasis in most recent studies has concentrated on sets of performance indicators. Such variables as productivity, adaptiveness, conformity, flexibility, satisfaction, and morale have been suggested by different researchers as the variables of the organization which reflect effectiveness. If effectiveness is to be achieved, high degrees of these variables must be realized.

Traditionally, organizational effectiveness has been treated as a total concept of overall goodness of the organization. This is a very

useful interpretation, but, as has been shown, it contains several pitfalls. Due to the complex composition of organizational objectives and procedures, effectiveness must be viewed as a relative phenomenon, and not from an all - or - none perspective. It is virtually impossible for an organization to exist free of conflict or completely fulfill the needs of all its members. With this in mind, the most recent studies have attempted to build a set of performance indicators for effectiveness. Because of complex, and possibly inverse relationships among these variables, a high degree of all of them is difficult, if not impossible, to obtain. However, it is along these lines that future studies must be conducted if the problems associated with organizational effectiveness are to be solved.

CHAPTER III

DESIGN OF THE EXPERIMENT AND PRESENTATION OF RESULTS

In an effort to establish the present educational and organizational effectiveness of Tex-Tech, four questionnaires were developed. The questionnaires were sent to each of four different groups: the Textile School faculty, present members of Tex-Tech, textile alumni who graduated since Tex-Tech began operations, and randomly chosen managers and executives of the textile industry in the state of Georgia. The intent of the questionnaires was to obtain four different views as to the policies, objectives, and value of Tex-Tech as an organizational and educational device.

The Faculty Questionnaire

The questionnaire presented to the Textile School faculty was designed to determine what should be the major operating objectives of Tex-Tech. Since the faculty is ultimately responsible for the success of Tex-Tech, they are the most appropriate group to make such decisions.

The survey required four unstructured responses. The questions were designed to receive personal answers from each individual faculty member. The cumulative responses were interpreted as the ultimate objectives and major problem areas of Tex-Tech.

The survey was conducted during the summer, 1975. Seven of 10 questionnaires were returned for a 70% response. Table 3-1 contains

the questions asked the faculty with their cumulative responses. The numbers listed after each response indicates the frequency of the response.

Table 3-1. The Faculty Questionnaire

1.	What do you perceive to be the three major goals of Tex-Tech? (List by importance)	
	1. (Most Important) Technical hands-on education in the textile processing area	7
	2. Experience in the management of people (leadership development)	5
	3. Exposure to a business environment	3
	4. Experience in solving instructured problems	2
2.	In practice, according to the actions of Tex-Tech as an organization, what are the goals of the organization?	
	1. Production and sale of products	5
	2. Development of the organization and management training	4
	3. Teaching of machinery operations	2
	4. Correlating work assignments with course work	2
3.	Do you think a change in priorities should take place in Tex-Tech? If so, please describe.	
	Unanimous: Yes	
	1. More emphasis on the educational and teaching aspects of technical and business operations problems	4
	2. Establish definite long-range objectives	2
4.	What improvements in policies or procedures of Tex-Tech would you make?	
	1. Long-range planning with clear objectives	4
	2. More faculty involvement	3
	3. Establish success measures	2

Because of the authoritative nature of this group, the results obtained from this questionnaire were interpreted as the major

objectives and problem areas of the organization. By utilizing the cumulative responses to question one, the primary objectives or goals of Tex-Tech were identified. This information was used in the design of subsequent questionnaires by attempting to measure how effectively Tex-Tech accomplishes these major objectives.

Tex-Tech Questionnaire

This survey was designed to determine what extent present members of Tex-Tech viewed the organization as attaining the faculty determined objectives of technical hands-on training in the processing area and exposure to problems involved in the management of people. It also attempted to determine any other objectives, strong points, and problem areas members of the organization thought to be important.

A total of 20 questions were included in the questionnaire. Seven questions requested unstructured answers. One question required responses from a list of alternative choices. The other 12 questions introduced the concept of a rating line. In response to these questions, participants were instructed to rate their answers by indicating a point on the line numbered zero to five. Zero was labeled; not at all while point five was labeled; completely. No labels were given points one through four. This was done in an effort not to bias the responses of the participants. Also, no midpoint was indicated on the line to eliminate the bias of that response. An example of the line used is shown in Figure 2.

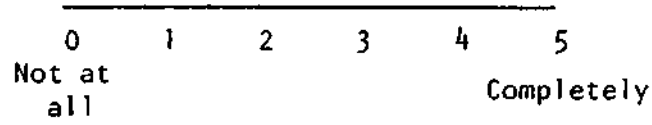

Figure 2. Rating Line Used to Answer Questions 3-14.

The questionnaire was conducted during a Wednesday operating session of Tex-Tech in November, 1975. A total of 45 participants responded to the questionnaire.

The questions asked of Tex-Tech members along with the cumulative responses to the questions are listed in Table 3-2. The numbers shown after questions 1, 2, 16, 17, 18, 19, and 20 indicate the frequency of those responses. The numbers after questions 3 - 14 indicate the mean and standard deviation of the responses to those questions. Question 15 lists the mean, total points, and total votes of each of the alternative choices. The scoring of this question is explained below.

Table 3-2. Tex-Tech Questionnaire

1.	According to the actions of Tex-Tech as an organization, what are its three major objectives?	
	1. To give students practical hands-on experience in the textile processing area	35
	2. To expose students to the problems of management	16
	3. Exposure to the problems of operating a textile company	15
	4. To be used as a teaching aid	15
	5. Production of products	12
2.	What do you perceive to be the three major goals of Tex-Tech?	
	1. To give students practical hands-on experience in the textile processing area	25
	2. To serve as a teaching aid	19
	3. To expose students to the problems of management	16

Table 3-2 (Continued)

4. To expose students to the operations of a textile plant	15
5. Produce a product	8
6. Make a profit	8

	Mean	Standard Deviation
3. How effectively is Tex-Tech aiding your education in the textile processing area?	2.98	1.09
4. How closely do you feel the business environment of Tex-Tech relates to the business environment in industry?	1.52	1.04
5. How effectively does your supervisor perform the responsibilities of his/her position in relation to the operations of Tex-Tech as an organization?	2.98	1.46
6. How effectively does your supervisor perform the responsibilities of his/her position in relation to the education or training of his/her subordinates?	2.64	1.43
7. How effectively is Tex-Tech exposing you to real-life problems expected to be encountered in the textile industry?	2.41	1.36
8. How effectively does Tex-Tech expose its members to a technical hands-on education in the textile processing area?	3.13	1.19
9. How effectively does Tex-Tech teach its supervisors to manage people?	2.08	1.25
10. How closely does the placement of members within Tex-Tech correspond to the courses they have scheduled?	1.98	1.32
11. How closely do the grades members receive correspond to the amount of work they have done?	2.48	1.37
12. How effectively do job assignments utilize the time of Tex-Tech members?	2.34	1.40

Table 3-2 (Continued)

	Mean	Standard Deviation
13. How effectively does the orientation program provided for new members in Tex-Tech introduce members to the policies and procedures of operating a textile company?	2.47	1.35
14. How effective are the inter-personal and inter-departmental communication systems in Tex-Tech?	2.66	1.17

15. Which of the areas do you feel are most important to the success of Tex-Tech as an organization? Please choose five areas and indicate relative importance by numbering 1 through 5 with number 1 most important.

This question was scored by allowing five points for a first place vote, four points for a second place vote, three points for third, two points for fourth, one for fifth, and zero for no indication.

	Mean	Total Points	Total Votes
1. Yarn Production	2.28	102	25
2. Fabric Production	2.13	96	30
3. Quality Control	1.58	71	27
4. Product Development	1.53	69	19
5. Long-Range Planning	1.27	57	16
6. Production Scheduling	1.11	50	18
7. Employee Relations	1.09	49	17
8. Personnel Administration	1.09	49	17
9. Finishing	.98	44	18
10. Marketing	.60	27	10
11. Industrial Engineering	.53	24	11
12. Process Evaluation	.31	14	6
13. Financial Planning	.27	12	6
14. Dyeing	.24	11	5
15. Accounting	0	0	0
16. Others	0	0	0

16. What effect does the changing of personnel and policies on a quarterly basis have on the operation of Tex-Tech as an organization?

Table 3-2 (Continued)

1. Good exposure to various industry positions	8
2. Does not allow sufficient time for the individual to adjust to the job, and results in inadequate training	6
3. Adversely affects the organization	6
4. Produces inefficiency in production, planning, and scheduling	5

17. What is the greatest benefit you obtain from Tex-Tech?

1. Hands-on experience with machinery	19
2. Experience with actual textile operations	15
3. No benefit	4

18. What would you like to gain from Tex-Tech, but have not?

1. Exposure to more actual industry-type problems	8
2. More training in management functions and responsibilities	7
3. More experience in the business aspects of operating a company	5

19. What improvements would you suggest for Tex-Tech?

1. More competent management	14
2. Keep machinery in working condition	10
3. More faculty involvement	9
4. More emphasis on production	8

20. What is your overall impression of Tex-Tech?

1. Good idea, partially attains objectives, but needs some changes	20
2. Good	10
3. Very bad	6

Alumni Questionnaire

The alumni questionnaire was mailed to all alumni of the Textile School who graduated since Tex-Tech began operations in January, 1973. This included the period from March, 1973 to September, 1975. A total of 62 questionnaires was mailed, but only 22 were returned. It is

believed, the major reason for only a 35% response was due to the fact all questionnaires were mailed to either the alumni's parents' home or to addresses as old as two years. Although a request was made to forward the survey to a current address, it is doubtful many were actually forwarded. This would indicate only a few of the questionnaires reached the alumni, and partially explain the relatively low response percentage.

Although the response rate was low, a good cross section of alumni returned the questionnaire. This conclusion was made as a result of personal information supplied by each alumni. Each survey asked participants to indicate the number of quarters they participated in Tex-Tech, the highest position they held in the organization, and the year in which they graduated. A very good distribution of these questions was supplied by responding alumni. Table 3-3 shows the breakdown of these variables.

The purpose of the alumni questionnaire was to evaluate how effectively Tex-Tech prepares its participants for later work in the textile industry. Also, by analyzing these responses, an indication of problem areas, strong points, and progress over the three years of Tex-Tech's existence could be obtained.

A total of 14 questions was included in the alumni questionnaire. Questions 1 through 10 implemented the same rating line used for the Tex-Tech questionnaire. Questions 11 through 14 sought unstructured responses. The questions contained in the alumni questionnaire with their cumulative responses are listed in Table 3-4. The numbers shown

Table 3-3. Breakdown of Personal Information Supplied by Alumni

Variables	Number in Group
Number of Quarters Involved in Tex-Tech	22
1-3 Quarters	8
4-6 Quarters	8
7 and above Quarters	6
Highest Position Held in Tex-Tech	22
Operative	4
Department Head	5
Vice-President	6
President	3
Did Not Indicate	4
Date of Graduation	22
1973	7
1974	8
1975	7

after questions 1-10 indicate the mean and standard deviation for the responses. The numbers shown after the responses to questions 11-14 indicate the frequency of that response.

Table 3-4. The Alumni Questionnaire

	Mean	Standard Deviation
1. Do you feel your experience in Tex-Tech aided your educational preparation in the textile processing area?	3.05	1.68
2. How beneficial to your job was the product production experience you received in Tex-Tech?	2.07	1.76
3. Were the problems you encountered in your dealings with Tex-Tech realistic? (as compared to actual on-jobs problems)	2.91	1.44
4. How well did your experience in Tex-Tech prepare you for any problems in the management of people you have faced on your job?	2.93	1.61

Table 3-4. (Continued)

5.	How effectively did your supervisor perform the responsibilities of his/her position in relation to the operations of Tex-Tech as an organization?	2.59	1.31
6.	How effectively did your supervisor perform the responsibilities of his/her position in relation to the training of his/her subordinates?	2.30	1.10
7.	How closely did the organizational structure of Tex-Tech relate to the organizational structure you encountered in industry?	3.21	1.26
8.	How closely do you feel the business environment of Tex-Tech is related to the business environment you encountered on your job?	2.48	1.50
9.	How well did Tex-Tech meet the objective of exposing students to technical hands-on education in the textile processing area?	2.95	1.62
10.	How well did Tex-Tech meet the objective of exposing students to problems in the management of people?	3.41	1.16
11.	What was the greatest benefit you obtained from your experience with Tex-Tech?		
	1. Exposure to management problems (such as organizing, motivating, and compromise)	9	
	2. Technical hands-on experience	6	
	3. Overall view of operations	2	
12.	What would you like to have received from Tex-Tech, but did not?		
	1. More technical experience in the processing area	11	
	2. Nothing more	2	
	3. More exposure to management problems	2	
	4. More experience in Tex-Tech (longer time)	2	
13.	What improvements would you suggest for Tex-Tech?		
	1. More involvement by faculty in supervising and advising	6	
	2. More emphasis on studying and improving machinery	4	
	3. Teach supervisory techniques	3	
14.	What was your overall impression of Tex-Tech?		
	1. Good to excellent	18	
	2. Negative	3	

Industry Questionnaire

The industry questionnaire was designed to determine which areas and objectives managers in the textile industry viewed as being the most important for Tex-Tech to better prepare its members for work in the textile industry. A total of 150 questionnaires was mailed to randomly chosen executives and managers in the textile industry from the state of Georgia. This list was composed of supervisors from the department head level to presidents of companies. Ninety-six questionnaires were returned, for a 64% response.

Two questions were contained in the survey. Both questions required answers to be chosen from lists of alternatives. If answers, not included in these lists, were preferred, spaces were provided so respondents could indicate their preferred choices. The scoring of the responses is described below. The results of this questionnaire are shown in Table 3-5.

Table 3-5. Industry Questionnaire

1. If you were overseeing operations of Tex-Tech, on which areas would you concentrate to better prepare students for work in the textile industry? Please choose five areas and indicate relative importance by numbering 1 through 5 with number 1 most important.

   This question was scored by allowing five points for a first place vote, four points for a second place vote, three points for third, two points for fourth, one for fifth, and zero for no indication. In a few incidences, more than one choice was indicated for a position. In these cases, the points for that position were equally divided among the choices. This accounts for point totals not being integers.

Table 3-5. (Continued)

		Mean	Total Points	Total Votes
1.	Yarn Production	2.43	233.7	64
2.	Employee Relations	2.26	217	63
3.	Fabric Production	2.10	201.8	61
4.	Quality Control	1.40	134	56
5.	Financial Planning	1.17	112	35
6.	Industrial Engineering	.88	83.5	34
7.	Marketing	.88	83.5	32
8.	Product Development	.78	74.5	26
9.	Production Scheduling	.66	63.5	24
10.	Long-Range Planning	.64	61	21
11.	Process Evaluation	.54	52	17
12.	Finishing	.46	44.2	20
13.	Personnel Administration	.29	28	14
14.	Dyeing	.22	21.3	15
15.	Accounting	.19	18	9
16.	Others	.13	12	4

2. What do you feel should be the major objectives or goals of Tex-Tech? Please choose three objectives and indicate relative importance by numbering 1 through 3 with number 1 most important.

This question was scored by allowing three points for a first place vote, two points for second, one for third, and zero for no indication. As in question 1, if more than one choice was indicated for the same position, points were equally divided among the duplicate choices.

		Mean	Total Points	Total Votes
1.	Management of people	1.30	125	54
2.	Developing leadership characteristics	.95	91	47
3.	Practical experience in the textile processing area	.83	80	46
4.	Experience in operating a profitable business	.73	70	31
5.	Dealing with employee morale and motivation problems	.49	47	23
6.	Production of products	.48	46.3	22
7.	Exposure to a business environment	.40	38	17
8.	Exposure to business administrative policies and procedures	.37	35	24
9.	Solving unstructured problems	.19	18	9
10.	Marketing of products	.14	13.8	10
11.	Sale of products	.10	9.8	6
12.	Others	.02	2	2

Summary

The four questionnaires were designed to obtain four different views to the operations of Tex-Tech. Each survey was conducted independently; however, the results from the faculty questionnaire influenced the design of the other surveys. The only response percentage not at a desired level was in response to the alumni questionnaire. However, even in this case, it appears a representative sample was obtained.

This chapter has presented the contents and cumulative responses of all questionnaires. Interpretations of these results along with statistical analyses are presented in Chapter IV.

CHAPTER IV

STATISTICAL ANALYSES AND INTERPRETATION OF QUESTIONNAIRE RESULTS

Introduction

After tabulating all of the responses to the four questionnaires, applicable results were factor analyzed to determine the factor structure of the responses and, analyses of variance or t-tests were used to test for response bias. All results were then interpreted both individually and collectively to determine the perceived current operating strengths and weaknesses of Tex-Tech.

The results of this analysis and comparison are presented in this chapter. Complete statistical data are included in the appendices. For interpretation purposes, several references will be made to the contents of the tables in Chapter III.

Statistical Analysis

Certain responses from the Tex-Tech, alumni, and industry questionnaires were tested to determine the significance of the data. The responses used for these purposes were: questions 3-15 from Table 3-2; questions 1-10 from Table 3-4; and both questions from Table 3-5. Due to the unstructured nature of all other answers, they were not applicable for these purposes.

On every questionnaire, with the exception of the faculty questionnaire, each respondent was asked to supply certain personal

information. This information determined the variables used in the analyses of data conducted.

The personal information asked of Tex-Tech members was:

1. Have you ever worked in the textile industry?
2. What is your status in school?
3. How many quarters have you been involved in Tex-Tech?
4. What positions in Tex-Tech have you held?

The variable of industry was divided into the groups of "yes" and "no" depending on if the individual did or did not have actual work experience in the industry. Status was classified according to class standing ranging from freshmen to graduate students. The quarters variable was divided into two groups with four quarters determining the divisional point. The first group was composed of all students who had participated in Tex-Tech for a total of four quarters or less; with the other group including all students who had participated more than four quarters. The position in Tex-Tech was classified according to the highest position attained. The responses of this variable were classified either in the operative or management groups. These variables and their classification frequencies are shown in Table 4-1.

Table 4-1. Breakdown of Tex-Tech Personal Information Variables

Variables	Classification	Number in Group
1. Industry	No	27
	Yes	18
2. Status	Freshmen	4
	Sophomores	11
	Juniors	11
	Seniors	15
	Graduate Students	4
3. Quarters	Four and less	33
	More than Four	12
4. Position	Operative	31
	Management	14

The information requested of alumni was:

1. Number of quarters involved in Tex-Tech
2. Positions held
3. Date of graduation (month/year)

The breakdown of this information has already been discussed and presented in Table 3-3.

Members of the textile industry were asked to indicate their job title and if they had or had not any familiarity with Tex-Tech prior to completing the questionnaire. Both variables were divided into two groups. The job title variable was classified according to position level, with the level of plant manager serving as the divisional point. The positions of plant manager and below composed one group, while all respondents in a position above plant manager composed the second group. The familiarity variable was divided into "yes" and "no" groups depending on any prior knowledge of Tex-Tech. The breakdown of these variables is presented in Table 4-2.

Table 4-2. Breakdown of Industry Personal Information Variables

	Variable	Classification	Number in Group
1.	Position	Plant Manager and Below	53
		Above Plant Manager	43
2.	Familiarity	No	47
		Yes	49

Several different analyses were conducted on all these variables using computer techniques from the second edition of the Statistical Package for the Social Sciences (SPSS). This book contains a system of

computer programs which allows social science data to be analyzed in a simple and convenient manner.

Questions 3-15 of the Tex-Tech questionnaire (refer to Table 3-2) were analyzed using SPSS methods of frequency, cross tabulation, t-test, and factor analysis. Subprogram Frequency conducted a one-way frequency distribution categorizing each question according to the number of each response. It also calculated the mean and standard deviation of each response. Subprogram Crosstabs computed n-way crosstabulation tables according to the personal information variables. In addition, it calculated the means and standard deviation of responses according to each group of variables. Subprogram t-test computed the significance levels for any differences of response means for each group. Using available data, Subprogram Factor determined the underlying patterns of relationship between the data which affected the responses.

Question 15 (Table 3-2) was analyzed using the frequency and breakdown methods provided by SPSS. Subprogram Breakdown calculated the mean and standard deviation for each of the personal information variables. It also performed analyses of variance with associated F-tests to determine the significant levels of mean differences between groups regarding their responses.

Questions 1-10 of the alumni questionnaire (refer to Table 3-4) were analyzed using the frequency, crosstabulation, factor analysis, and t-test methods identical to those used for the Tex-Tech questionnaire.

The data provided from both questions of the industry questionnaire

(refer to Table 3-5) were analyzed as the data of Question 15 of the Tex-Tech questionnaire.

The findings from these analyses show relatively few significant differences between the responding groups. In addition, they revealed underlying factors which did influence responses. The results of these analyses are listed below.

1. t-tests were conducted on question 3-15 of the Tex-Tech questionnaire (Table 3-2) by pairing all categories for each personal variable (Table 4-1).

The two groups from the industry variable were compared and no significant t's at the .01 level were found.

For t-test purposes, the status variable was reorganized as follows: freshmen and sophomores composed group one; juniors composed group two; and seniors composed group three. Graduate student responses were not used. Three different pairings were constructed: group one and group two; group one and group three; and group two and group three. Of 36 tests conducted, only three were found significant at the .01 level. This small number could have been a result of chance.

The two groups derived from the quarters variable were compared. Only one result of 12 tests was found to be significant at the .01 level. The same results were obtained when the position variable groups of operative and management were compared.

Both of these significant level t's were in response to the same question, number 7 (Table 3-2). This result indicated more experienced students believe they are being prepared better for work in the textile industry than do students with less experience in Tex-Tech.

2. F-tests were conducted on question 15 (Table 3-2) using the variables of industry, status, quarters, and position. Only one of 64 tests conducted was found significant at the .01 level. This percentage is within the chance level.

3. Using the personal variables and resulting groups supplied by alumni (Table 3-3), t-tests were conducted on questions 1-10 of the alumni Questionnaire (Table 3-4). Of 120 tests conducted only two were significant at the .01 level. Again, a chance finding.

4. Fifty-four F-tests were performed on the industry questionnaire results using the personal variables previously described. Only one test was found to be significant at the .01 level.

In general, the variables tested for all groups did not affect the manner in which individuals responded to the questions. The indication is the questions were answered as conscientiously as possible, and in an unbiased manner.

5. Factor analyses were performed on the data from questions 1-10 of the alumni questionnaire (Table 3-4) and questions 3-14 of the Tex-Tech questionnaire (Table 3-2). Essentially two factors were found in the data for both groups. The alumni emphasized the value of Tex-Tech as preparation for later work in the sense of having encountered "real" problems. Tex-Tech members tended to emphasize their personal position and evaluation of them by supervisors in Tex-Tech. This is probably a result of the relative lack of industrial experience by the students. They are, for the most part, not able to assess the potential value of Tex-Tech to them for their later careers. In view of the previously described F and t tests, this somewhat different evaluation

does not seem to have biased the questionnaire answers.

Questionnaire Interpretations

Faculty Questionnaire

The results of this questionnaire (Table 3-1) indicate, from the point of view of the faculty, what Tex-Tech as an organization should be accomplishing and what it is attempting to accomplish are not the same.

The faculty agrees with the formal charter of Tex-Tech concerning the two major objectives of the organization. Article I of the Company By-Laws states the two basic goals of Tex-Tech: 1) to prepare students for leadership roles in the textile industry; and 2) to provide hands-on experience with the technical aspects of the textile industry. In addition to these, the faculty viewed exposure to a business environment and experience in solving unstructured problems important objectives of Tex-Tech.

In practice, however, the faculty feels the organization places too much emphasis on the production and sale of products, and development of the organization. Concensus of the faculty is the organization should put more emphasis on the educational and instructional aspects of technical problems, first, and business problems, second.

The faculty recommends Tex-Tech establish long-range objectives and success measures. More faculty involvement is a suggestion for improvement which is also recommended.

The faculty feels Tex-Tech is not accomplishing major objectives of the organization. Instead of concentrating on the educational benefits, the organization, in practice, is more concerned with producing

products. This is done at the expense of developing objectives for the organization which could be realized in the long run. The organization operates too much on a quarterly or short run basis instead of planning for the future.

Tex-Tech Questionnaire

The main results of this questionnaire is that students see the two major goals of Tex-Tech as preparing students for leadership roles in the textile industry and exposure to hands-on experience with technical aspects of textile processing. However, they also indicate the organization is not completely achieving these objectives.

The members of Tex-Tech feel the actions of the organization place a greal deal of emphasis on the attainment of its two major objectives. They also indicate considerable emphasis is placed on the problems of operating a textile company and the organization's value as an educational device. However, they do agree with the faculty that production is stressed.

Questions 3-14 (Tables 3-2) attempted to evaluate how effectively Tex-Tech is accomplishing its two major objectives. The mean response of these questions was 2.47 (standard deviation = .44), which was considered as a rating in the average range.

The three questions which received the lowest rated answers were:

1. How closely do you feel the business environment of Tex-Tech relates to the business environment in industry? Mean = 1.52
2. How closely does the placement of members within Tex-Tech correspond to the courses they have scheduled? Mean = 1.98
3. How effectively does Tex-Tech teach its supervisors to manage people Mean = 2.08

The question of teaching supervisors to manage people is of major importance. Training of supervisors to handle people problems is a major part of preparing students for leadership roles in the textile industry. This low response, in the opinion of Tex-Tech members, indicates the need for considerable improvement in this area.

The low response to the question of member placement is also an area for concern. In practice, members are placed within Tex-Tech in accordance with the academic courses they concurrently schedule. Although this is an objective which is all but impossible to completely attain, a response as low as the one obtained indicates member placement is perceived as a major weakness of the organization.

A low response to the question concerning business environment is also discouraging, since the faculty rated this as the third most important objective of Tex-Tech. It would be very difficult, however, for Tex-Tech to portray a strong business image because it is part of an institution whose primary function is educational in nature.

The questions which received the highest ratings revealed some interesting results. These questions were:

1. How effectively does Tex-Tech expose its members to technical hands-on education in the textile processing area? Mean = 3.13
2. How effectively is Tex-Tech aiding your education in the textile processing area? Mean = 2.98
3. How effectively does your supervisor perform the responsibilities of his/her position in relation to the operations of Tex-Tech as an organization? Mean = 2.98

The first two questions pertain to the organizational objective of providing hands-on experience with the technical aspects of the textile industry. The high scores obtained from these questions reflect a

relatively high attainment of this objective.

The third question reflects effectiveness of supervisors. This high score is in direct opposition to the score on the question concerning teaching supervisors to manage people. Obviously, Tex-Tech members feel supervisors are effective in operating the technical aspects of the organization, but ineffective in their dealings with people, especially subordinates.

Three questions were asked to directly assess the degree of attainment of each of the two major objectives of Tex-Tech. The questions pertaining to the objective of hands-on experience were:

1. How effectively does Tex-Tech expose its members to a technical hands-on education in the textile processing area? Mean = 3.13
2. How effectively is Tex-Tech aiding your education in the textile processing area? Mean = 2.98
3. How effectively is Tex-Tech exposing you to real-life problems expected to be encountered in the textile industry? Mean = 2.41

Two of these questions received the highest ratings of all questions. The third question, pertaining to real-life problems, received a rating slightly below average. The mean for these questions is 2.84, indicating members of Tex-Tech feel the organization is adequately attaining this major objective.

The questions concerning the objective of preparing students for leadership roles received somewhat lower ratings. These three questions were:

1. How effectively does your supervisor perform the responsibilities of his/her position in relation to the operations of Tex-Tech as an organization? Mean = 2.98
2. How effectively does your supervisor perform the responsibilities of his/her position in relation to the education or training of his/her subordinates? Mean = 2.65

3. How effectively does Tex-Tech teach its supervisors to manage people? Mean = 2.08

The mean for these responses is 2.57 which is lower than responses to questions concerning hands-on experience. The low result to the question concerning management of people indicates this is the weak area of the management's responsibilities. These results support the conclusion previously mentioned that Tex-Tech's supervisors do a much better job in the technical area of running the operations of the organization and training of subordinates than they do in their dealings with people problems.

Concerning the personal information variables (Table 4-1), several trends developed as a result of the variable breakdown. Those members who had participated in Tex-Tech more than four quarters responded higher to 10 of 12 questions. This indicates as members become more familiar with Tex-Tech, they tend to have a greater appreciation of the organization. Managers answered eight of 12 questions higher than did operatives. Interestingly, operatives rated two of the three questions concerning preparation of students for leadership roles higher than did managers. Concerning status, juniors ranked eight of the questions lower than any other class. In every case, juniors ranked questions lower than seniors. One possible explanation for this concerns the two groups' relative positions in Tex-Tech. Nine of 11 juniors who responded to the questionnaire were classified as operatives, while 12 of 15 seniors were managers. Breakdown by the industry produced no trends. Although these trends were present; as has been already discussed, they did not reach the .01 significance level.

Tex-Tech members feel the most important areas of operation are yarn and fabric production. They also rate quality control and product development very high. All of these areas indicate emphasis on production of products and the technical aspects of production. Such areas as employee relations, which are management functions, were rated lower in priority.

Members felt changing of personnel on a quarterly basis provides good exposure to various industry positions, but results in inadequate job training and adversely affects the organization. Three months should be sufficient time to train individuals the functions of his specific assignment. Especially is this true on the operative level.

Members felt the greatest benefit they derived from Tex-Tech was hands-on experience with machinery and with actual textile operations. Four members indicated they receive no benefit. However, this represented less than 10% of the responses, and is not of apparent importance. Interestingly, no mention was made concerning the benefit of exposure to management problems

In response to the question, what would you like to gain from Tex-Tech but have not, most items mentioned were business or management oriented. The major items on this list were more exposure to industry-type problems, training in management functions and responsibilities, and experience in the business aspects of operating a company. From these responses, it is evident students believe not enough emphasis is given in these areas.

Concerning suggestions for organizational improvements, Tex-Tech felt more competent management was of upmost importance. Increased

machinery maintenance was also mentioned frequently along with more faculty involvement and emphasis on production. These items indicate better leadership is needed for the organization. This is not limited to the managers within Tex-Tech. Maintenance and faculty involvement were external factors beyond the control of Tex-Tech managers.

The consensus opinion of Tex-Tech members was the organization is a worthwhile project, which has been useful for the individual members. However, changes and improvements are needed.

The results of this questionnaire indicate the major weakness of the organization is the leadership area. Most suggestions for improvement centered around this issue. Also, more experience in management and business operations were seen as areas where more training is desirable. Questions asking for a rating of supervisor effectiveness were rated lower than questions concerning technical experience. All of these results indicate improved leadership is desired in Tex-Tech. On the other hand, most positive comments concerned the education aspects of the organization in the technical and processing area.

Alumni Questionnaire

The results of this questionnaire indicate the alumni feel Tex-Tech is adequately achieving its two major objectives. They rated all questions which utilized the concept of the rating line higher than did members of Tex-Tech, with the mean response being 2.79 (standard deviation = .40).

Four questions were asked alumni which directly referred to the organizational objective of exposure to management problems. These were:

1. How well did Tex-Tech meet the objective of exposing students to problems in the management of people? Mean = 3.41
2. How well did your experience in Tex-Tech prepare you for any problems in the management of people you have faced on your job? Mean = 2.93
3. How effectively did your supervisor perform the responsibilities of his/her position in relation to the operations of Tex-Tech as an organization? Mean = 2.59
4. How effectively did your supervisor perform the responsibilities of his/her position in relation to the training of his/her subordinates? Mean = 2.30

The mean of these responses is 2.81, which is in the average range. The results indicate alumni feel Tex-Tech is adequately accomplishing its objective of exposure to management problems in training for leadership. The first question concerning exposing students to the problems in the management of people received the top ranking of all questions. The second question concerning management of people is also rated above average, indicating this area of management is Tex-Tech's strong point. The other two questions relating to management functions of running the operations of Tex-Tech and training of subordinates received ratings below average. Obviously, alumni feel Tex-Tech exposes members to "people" problems in management better than technical problems of management.

Three questions were asked alumni to determine how effectively Tex-Tech was accomplishing the objective of exposing students to technical hands-on problems in the textile processing area. These questions are listed below.

1. Do you feel your experience in Tex-Tech aided your educational preparation in the textile processing area? Mean = 3.05
2. How well did Tex-Tech meet the objective of exposing students to technical hands-on education in the textile processing area? Mean = 2.95

3. How beneficial to your job was the product production experience you received in Tex-Tech? Mean = 2.07

The mean for these questions was 2.69, which was slightly below average. Production experience received a very low rating, indicating this area was not very beneficial for alumni on their job. The other two questions concerning technical experience in the processing area received higher ratings. These results indicate the actual production experience received in Tex-Tech is not very relevant to actual on-job production in the textile industry.

With regards to the personal information variables asked of alumni (Table 3-3), several response trends were found. Alumni who participated in Tex-Tech for more than seven quarters rated seven of 10 questions higher than members who had less experience. In nine of 10 questions, operatives gave lower ratings than all other groups in the status category. In contrast, presidents rated five questions the highest. These trends support the proposition that members of Tex-Tech who have the most experience and more important positions tend to evaluate the organization more favorably.

No trend was detectable between the groups of the year of graduation variable. This is unfortunate, because it indicates a lack of organizational development over the past three years.

However, as has already been discussed, these trends were not significant at the .01 level.

Alumni feel the greatest benefit they received from Tex-Tech was exposure to management problems. Also considered important was the technical hands-on experience in the textile processing area and an

overall view of the operations of a textile company. However, the major item which they would have liked to receive, but did not, was more technical experience in the processing area. Included in this category, but to a much lesser extent, was more exposure to management problems.

Concerning improvements for Tex-Tech, the cumulative response of alumni indicated three suggestions. The major suggestion was increased faculty involvement in the supervising and advising areas. More emphasis on studying and improving machinery was also considered important by alumni along with the teaching of supervisory techniques.

Almost 90% of the alumni stated their overall impression of Tex-Tech was good to excellent.

The results of this questionnaire indicate alumni have a high opinion of Tex-Tech. They rated exposure to management problems as the greatest benefit they received from their experience in the organization. Of all aspects of the management areas, exposure to people problems received the most favorable responses.

Alumni suggest faculty should take a more active role in supervising and advising of Tex-Tech operations. Also, increased machinery maintenance was suggested frequently.

The overall impression of Tex-Tech was very good from the point of view of alumni.

Industry Questionnaire

The results to this questionnaire indicated a strong preference of managers and executives in the textile industry for areas and objectives concerning management and production.

In response to question one (see Table 3-5), respondents rated yarn production, employee relations, and fabric production as the top three areas on which Tex-Tech should concentrate. All three of these choices were listed in more than 65% of the responses, and rated higher than all other choices. Of less importance, but ranked high in priority were quality control and financial planning. All five of these areas related directly to management and production.

The same type responses were also found to question two. Management of people and developing leadership characteristics were ranked as the first and second objectives on which the organization should concentrate. Practical experience in the textile processing area was ranked third, while another management function, experience in operating a profitable business was ranked fourth. This group of objectives was ranked substantially higher than all other choices.

Apparently, managers and executives in the textile industry feel management of people, practical production experience, and the financial aspects of operating a business are the most important areas for Tex-Tech to concentrate on in order to prepare its students for later work. The technical aspects of the industry were ranked lower in priority than these areas.

Comparison of Questionnaires

When the results of the questionnaires were viewed collectively instead of individually, they produced both interesting similarities and differences. Several questions were asked of more than one responding group with answers varying from group to group.

The question concerning the goals of Tex-Tech according to the actions of the organization was asked of both the faculty and Tex-Tech members. The faculty felt that the majority of efforts in Tex-Tech were toward production and sale of products, and developing the organization. Tex-Tech members felt the major operating goals of the organization were to give students practical hands-on experience in the textile processing area and to serve as a teaching aid. Also frequently mentioned was exposure to the problems of management and to the operations of a textile plant. Students felt that production was stressed, but to a much less extent than did the faculty. Students ranked this objective fifth, while the faculty felt it was number one. Apparently, Tex-Tech members feel the organization is attempting to accomplish its two primary objectives better than did the faculty.

Both the members of Tex-Tech and the alumni were asked what they considered to be the greatest benefits they obtained from Tex-Tech. Tex-Tech members felt these benefits were in the technical area of machinery and operations, while alumni felt the major benefit was exposure to such management problems as organizing, motivating, and compromise. Technical experience and overall view of operations were ranked second and third. From these results and others to be discussed later, it is apparent that Tex-Tech members and alumni place different emphasis on major priorities. Generally, alumni and industry respondents stress experience in the management of people. Tex-Tech students stress technical experience.

Tex-Tech members and alumni were also asked what items they would like to receive from Tex-Tech, but did not. Tex-Tech members stressed

more actual industry-type problems and training in management functions and responsibilities. Alumni stated as their only major issue, they would like to receive more experience in the technical aspects of the processing area. Again, these results are almost exactly opposite of each other.

The faculty, Tex-Tech members, and alumni were all asked to make suggestions for organizational improvement. All three groups recommended more faculty involvement in the operating procedures of Tex-Tech. This indicates all groups feel the need for closer supervision of the organization. In agreement with this conclusion, Tex-Tech members also recommend more competent management within the organization, and the alumni recommend the teaching of supervisory techniques.

The next most frequently mentioned suggestion was better maintenance of machinery to keep it in working condition. Both Tex-Tech members and alumni ranked this suggestion second in priority. This result indicates Tex-Tech as an organization is not receiving sufficient support from other components of the Textile School. Tex-Tech is designed to be a learning experience with a major part of this experience in the processing area. If the machinery is not kept in working order, this educational aspect will be severely limited. All of this responsibility, however, should not be placed on the Textile School. Students should assume partial responsibility for machinery failure, since their use, as a group, of the machinery is the major reason for its failure. Nevertheless, this appears to be a major problem area, and all parties concerned should attempt to solve the problem.

The major suggestion for improvements from the faculty was the establishment of long-range and clear objectives. They also recommend establishing success measures for the organization.

It is obvious both Tex-Tech members and alumni suggest improvement which would benefit the organization in the short run. In contrast, the faculty suggestions were for the long run betterment of the organization.

Several of the rating line questions in the Tex-Tech questionnaire were also included in the alumni questionnaire. Table 4-3 compares the response mean of these questions. The horizontal rows of the table refer to the question number from each questionnaire. Although the numbers in the row differ, the questions are the same.

Table 4-3. Comparative Results of Rating Line Questions asked Tex-Tech Members and Alumni

Tex-Tech Question Number (Refer to Table 3-2)	Mean	Alumni Question Number (Refer to Table 3-4)	Mean
3	2.98	1	3.05
4	1.52	8	2.48
5	2.98	5	2.59
6	2.64	6	2.30
7	2.41	3	2.91
8	3.13	9	2.95
9	2.08	10	3.41

The rank order correlation (rho) is 0.215 indicating low agreement between groups.

The questions rated higher by Tex-Tech members concerned management responsibilities in relation to the operations of Tex-Tech as an

organization, and the training of subordinates. Members of Tex-Tech also rated higher on the question concerning the effectiveness of Tex-Tech in exposing its members to technical hands-on education in the textile processing area. All of these answers reflect technical aspects. Discussed earlier was the relativity of these two technical areas of management to management of people.

Alumni answers were higher to questions concerning management of people and real-world problems in the processing area.

The last question asked of more than one group was the question concerning areas of concentration important to Tex-Tech. This question was asked of both Tex-Tech members and industry managers. There was relatively strong agreement concerning yarn production, fabric production, and quality control. Tex-Tech members rated these choices one, two, and three respectively, while industry managers rated them one, three, and four. The most significant difference concerned the choice, employee relations. Tex-Tech rated this choice seventh with a mean of 1.09. The industry questionnaire results show this choice rated second with a mean of 2.26. This result shows the importance industry managers place on people. Tex-Tech obviously does not feel people are as important. They stressed product development, long-range planning, and production scheduling above employee relations.

In review of all questionnaires, the most obvious difference between the results was the great amount of importance alumni and industry managers and executives placed on people problems. Alumni rated all questions concerning management of people very high. They also

indicated their greatest benefit derived from Tex-Tech was exposure to problems in the area of management of people. Industry managers ranked employee relations number two in importance, only one vote behind yarn production. The technical aspects of the industry was rated second to people aspects.

Just the opposite is true according to the faculty and Tex-Tech members. The faculty feels technical hands-on experience in the textile processing area is the most important objective for Tex-Tech. Tex-Tech members rate all questions directly referring to technical aspects relatively high. They feel Tex-Tech's major strong point is in this area, while its major weakness is in the management of people area. They also suggest more competent management as the major suggestion for improvement.

Apparently, the Textile School stresses these technical aspects. Most coursework revolves around them, and this carries over into Tex-Tech. Members of the organization have been taught that these aspects are the most important. Therefore, because of this emphasis, they naturally rate all issues concerning the technical area relatively high. Even the managers tend to perform the technical aspects of their responsibilities better.

However, industry puts relatively more emphasis on people problems. Upon entering an environment with different priorities, alumni conform to these new priorities. This change results in them rating questions concerning management of people high and technical aspects lower. It seems that actual industry experience alters perceptions as to what is desirable in the education of textile students.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

Conducting an organizational effectiveness study on Tex-Tech Enterprises was difficult. Because of the nature of the organization, most literature on the issue did not directly apply to Tex-Tech.

Tex-Tech is a unique organization in many ways. Such industry problems as low efficiency, production rates, and turnover, which are of considerable importance in industry, are inherent in the functioning of Tex-Tech. Directly applying common techniques to Tex-Tech would have produced inaccurate and misleading results.

The systems approach to the subject, which is growing in popularity among theorists, has very little application in this study. This approach is most applicable in a comparative sense. Because of Tex-Tech's unique nature, there existed nothing with which it could be compared. Also, because of lack of organizational records, it was not even possible to evaluate Tex-Tech with itself at different points in time. In addition, the systems approach considers effectiveness an issue of organization's ability to exploit their environment for scarce resources. This characteristic lacked any apparent relationship to Tex-Tech.

Characteristics of the goal approach had significantly more in common with Tex-Tech. Although the formal charter of the organization prescribes two major goals of the organization, no attempt had ever been made either to substantiate these objectives, or to determine any other

objectives. Thus, the real purposes of the organization had never been clarified.

It is concluded that the two major objectives prescribed in the formal charter were indeed the major functions of the organization. Preparing students for leadership roles in the textile industry by exposure to management problems, and exposure to technical aspects of the industry by allowing students hands-on experience in the processing area, were determined, as a result of all questionnaires, to be the organization's two main goals which it should strive to accomplish.

Although the organization's main objectives were defined, the question of organizational effectiveness was very difficult to determine. In fact, due to the nature of Tex-Tech, organizational effectiveness did not adequately apply. Effectiveness, by itself, is not a desired state of the organization. Educational effectiveness is a more appropriate issue to Tex-Tech than solely organizational effectiveness.

Educational effectiveness cannot be treated from an all or nothing point of view, nor can it be treated as a single unit. While certain aspects of the issue may be obtained, deficiencies were also present.

From the questionnaire results, Tex-Tech was judged as adequately attaining its two major goals. Tex-Tech students rated questions pertaining to the exposure to technical aspects relatively high, while alumni rated questions concerning management problems very high. To obtain both these objectives completely would be equal to learning everything known in both areas. Since this would be all but impossible, the relatively high response ratings obtained were judged to be adequate for successful realization of the goals.

However, three major interdependent problem areas were discovered which hindered increased goal attainment. The first of these is the conflict between environmental influences. The Textile School stresses technical aspects pertaining to the educational experience. This was exhibited in the results of both the faculty and Tex-Tech questionnaire. The faculty rated technical hands-on experience in the textile processing area as the primary objective of the organization. The emphasis they place in this area apparently influenced the manner in which Tex-Tech members responded to their questions. Another probable influence on Tex-Tech members was the technical nature of the majority of their coursework. Industry managers, on the other hand, rated management problems, especially concerning people, higher than most technical aspects of the industry. Apparently, this emphasis from their environment affected the answers of the alumni. They rated exposure to management problems as the greatest benefit they received from Tex-Tech. Also, of questions which utilized the rating line, alumni responded higher to questions concerning management of people.

Since both technical and management areas received high ratings when all results were compared, Tex-Tech was judged to attain both objectives. The environmental emphasis, however, affects students perception of the value of the organization. This fact leads to a communication problem.

Apparently, students are not fully aware of what Tex-Tech is attempting to accomplish. Tex-Tech members judge Tex-Tech from a technical viewpoint without seeing the value of their management experience. The management aspect becomes of interest only after having worked in

the industry environment. Also, Tex-Tech stresses production. In several different personal interviews, students stated the finished product was the only accomplishment they derived. This is a direct result of their seeming lack of awareness as to the total benefit of the organization. Although students agreed with the faculty concerning the major objectives of Tex-Tech, it is questionable whether they fully understand the actual meaning of these objectives. Nevertheless, it is apparent students do not derive the complete personal benefit the organization offers. This is a lack of communication between students and faculty concerning the true meaning of the individual's experience in Tex-Tech.

This lack of communications leads to a third problem area of leadership. The problem includes both Tex-Tech management and the Textile School faculty. Tex-Tech students ranked more competent management as their number one recommendations for improvement. Obviously, the management of Tex-Tech is not perceived as performing as well as it could. It is doubtful that the reasons for this are of a simple nature. The present study was unable to determine any reasons other than the lack of emphasis placed on management in the environment. A study should be undertaken to attempt to solve this problem.

In any case, it seems that faculty leadership could be improved. Tex-Tech was designed with the objective it be a student operated company with a minimum of faculty involvement. However, it is becoming more and more apparent,students do not have the capabilities to run the company by themselves. Although the bulk of responsibilities of the

actual operations should, indeed, lie with the students, planning, preparation of students for Tex-Tech, and maintenance of the organization should be the responsibility of the faculty. This increased involvement of the faculty was suggested on the alumni, students, and faculty questionnaire, which indicates an immediate need. Especially is this true in the maintenance department. Both alumni and members of Tex-Tech stressed the need to keep machinery in operating condition. Since, in most cases, students do not have the knowledge to maintain machinery, this responsibility must be with the Textile School faculty and staff. Also, both students and alumni tended to emphasize areas of short-term importance. This is understandable because an individual's time in the organization is limited. Therefore, long term planning must be with a group who will be associated with the organization for a longer period of time. The faculty is the most appropriate group.

Therefore, it is suggested the Board of Directors of Tex-Tech be reorganized to include primarily faculty members. Under this plan the Board of Directors would consist of six faculty members, and the President of Tex-Tech, all in a voting capacity. One member would be the Director of the School of Textile Engineering who would serve as Chairman of the Board. The other five faculty members would consist of three members from the Textile School faculty and two from faculties of schools other than the Textile School. The three members from the Textile School would consist of one each from the three areas of interest within the school; chemistry, engineering, and management. Outside members could come from any of several textile related disciplines.

These would include Chemistry, Chemical Engineering, Mechanical Engineering, Industrial Engineering, Industrial Management, and Industrial Psychology. This composition would insure a wide range of interests and opinions so that a single area of Tex-Tech would not receive too much emphasis at the expense of other areas. Also membership of Tex-Tech's President would insure current students desires and objectives not be de-emphasized.

This would represent a more realistic Board than now exists, because in most companies, the Board of Directors is not composed entirely of company management. It would be the responsibility of the Board to establish both short and long-term objectives for Tex-Tech and guide the current company members toward achieving those objectives. Such an arrangement would begin to solve some of the current problems concerning leadership and lack of management influence.

The Board would meet a minimum of one time per quarter with the dual purpose of reviewing past quarter's achievements and establishing next quarter's objectives. Both present and future Tex-Tech Presidents would attend this meeting with only the incoming President in a voting capacity.

A job analysis should also be conducted in Tex-Tech for the purpose of defining the duties and objectives of each position in the organization. Tex-Tech members are not in school to train to be operative level employees; therefore, the operative positions should be designed to be challenging. Apparently, due to the low responses received by operatives, this is not being done. In addition, the actual

responsibilities of some management positions have not been precisely defined. The jobs could probably be designed to give students a better understanding of the purpose of their position, and what they should be accomplishing while doing their job. Also, by studying positions, some of the deficiencies of jobs could be identified in an effort to upgrade assignments.

In addition to job design, some sort of success measure should be established. Currently the only items used for this purpose are the grades members receive and production of a finished product. Such measures should be established to provide students with a feeling of accomplishment and pride in their work. If students could have a better feeling for what they accomplish, employee morale and job satisfaction would, probably, increase.

Additional emphasis should also be placed in the areas concerning management of people and maintenance.

It is suggested, therefore, management seminars be scheduled with guest speakers, including faculty members from other departments, to discuss problems in this area. A further knowledge in such areas as morale, motivation, and satisfaction would aid supervisors in Tex-Tech with solutions to some of the problems they currently face, and will face in their later careers.

Students should also receive more training in such maintenance areas as safety, housekeeping, and repair of machinery. Although machinery repair is not a primary interest of most students, increased knowledge in this area will aid both their technical education in the

processing area, and the total operation of Tex-Tech as an organization. Presently, machinery maintenance must be the responsibility of the faculty and staff, however, in the future, Tex-Tech members should be prepared to share this responsibility.

Tex-Tech should be treated as an industry training program because that is exactly what it was designed to be. In such training programs, fundamentals are stressed. The goal of such programs is to familiarize participants with all aspects of the organization before they actually become members of the formal organization. In the industry, the companies which produce the highest quality output are the most successful. Although the major output of Tex-Tech is students instead of produced objects, the organization should adopt this policy. Any thing which might upgrade the quality of students should be stressed by the organization. It should be remembered all students differ in objectives and interests. Tex-Tech should adopt a policy which would take into account these individual differences by allowing each member to pursue areas which interest them most, insofar as this is possible. By increasing training aspects, the individuals would receive more personal attention and be able to better develop their own personal objectives.

An inherent problem of Tex-Tech is which priorities should be stressed; personal or organizational. Currently, Tex-Tech members stress such organizational goals as production because this gives them their major sense of accomplishment. In theory, however, personal goals should receive more emphasis. Unfortunately, these priorities are in

conflict. Attainment of one set of goals will hinder the attainment of the other set. This becomes an issue of either organizational effectiveness or educational effectiveness. Both areas have several merits and would benefit students in different ways. Therefore, an optimum emphasis of both areas is the most desired state. Increasing quality of leadership, setting of clear objectives, communication between all groups, and training of students would help to reach this optimum relationship.

In conclusion, the purpose of this study was not to reform Tex-Tech. Its major objective was to review organizational effectiveness studies as a basis for an evaluation of Tex-Tech. As determined, a goal oriented approach was necessary, using the opinions of relevant groups as data, for this study. Some major problem areas were indicated and some solutions suggested for the future operations of Tex-Tech.

Using this study as a guide, additional studies should be undertaken periodically to evaluate and compare the organizational and educational effectiveness of Tex-Tech at different points in time. It is important for such studies that additional information from alumni be obtained on a continuing basis.

APPENDIX A

STATISTICAL DATA FROM THE TEX-TECH QUESTIONNAIRE

Table A-1. Questions Used in Tables A-3 to A-7

Question 3	How effectively is Tex-Tech aiding your education in the textile processing area?
Question 4	How closely do you feel the business environment of Tex-Tech relates to the business environment in industry?
Question 5	How effectively does your supervisor perform the responsibilities of his/her position in relation to the operations of Tex-Tech as an organization?
Question 6	How effectively does your supervisor perform the responsibilities of his/her position in relation to the education or training of his/her subordinates?
Question 7	How effectively is Tex-Tech exposing you to real-life problems expected to be encountered in the textile industry?
Question 8	How effectively does Tex-Tech expose its members to technical hands-on education in the textile processing area?
Question 9	How effectively does Tex-Tech teach its supervisors to manage people?
Question 10	How closely does the placement of members within Tex-Tech correspond to the courses they have scheduled?
Question 11	How closely do the grades members receive correspond to the amount of work they have done?
Question 12	How effectively do job assignments utilize the time of Tex-Tech members?
Question 13	How effectively does the orientation program provided for new members in Tex-Tech introduce members to the policies and procedures of operating a textile company?
Question 14	How effective are the interpersonal and interdepartmental communication systems in Tex-Tech?

Table A-2. Numbers for Personal Variable Groups

Variables	Numbers in Group	
Industry	45	
No		27
Yes		18
Status	45	
Freshmen		4
Sophomores		11
Juniors		11
Seniors		15
Graduate Students		4
Quarters	45	
Four and less		33
More than four		12
Position	45	
Operatives		31
Managers		14

Table A-3. Mean ($\bar{x}$) and Standard Deviation (S.D.) for Prior-Industry-Experience Variable Groups

Question	Prior Industry Experience			
	No		Yes	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.
3	3.17	1.03	2.75	1.14
4	1.48	1.01	1.56	1.08
5	3.07	1.40	2.92	1.49
6	2.98	1.33	2.31	1.33
7	2.50	1.45	2.39	1.17
8	3.02	1.26	3.31	1.18
9	2.15	1.35	1.95	.99
10	1.91	1.18	2.06	1.45
11	2.48	1.35	2.25	1.46
12	2.22	1.48	2.42	1.45
13	2.17	1.54	2.95	.91
14	2.61	1.04	2.81	1.29

Table A-4. Mean ($\bar{x}$) and Standard Deviation (S.D.) for Status-in-School Variable Groups

Question	Status in School									
	Freshmen		Sophomores		Juniors		Seniors		Graduate Students	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
3	3.00	2.50	3.32	.92	2.27	1.13	3.27	.68	2.88	1.05
4	1.63	.92	1.55	.75	1.36	1.14	1.57	1.10	1.60	1.30
5	3.75	1.69	2.86	1.82	2.73	1.37	3.10	1.51	2.75	3.06
6	3.25	2.19	2.50	1.50	2.41	1.58	2.87	1.20	2.25	4.06
7	2.75	1.19	1.64	.60	2.14	1.47	3.20	1.18	2.00	2.88
8	4.00	.50	3.00	1.82	2.23	1.31	3.70	.75	3.00	.88
9	3.25	1.69	1.91	1.17	1.64	1.19	2.17	1.06	2.25	2.81
10	2.25	2.19	1.73	1.11	1.68	1.08	2.30	1.49	2.00	2.38
11	3.13	1.55	2.04	2.97	2.14	1.16	2.60	1.18	3.50	.38
12	3.38	2.67	2.14	1.75	1.45	1.06	2.77	1.39	2.75	.31
13	2.25	3.19	1.82	1.15	2.45	1.15	3.13	1.26	2.00	1.88
14	2.12	1.55	2.05	1.25	2.73	1.08	3.30	.82	2.25	1.81

Table A-5. Mean ($\bar{x}$) and Standard Deviation (S.D.) for Number-of-Quarters-in-Tex-Tech Variable Groups

Question	Number of Quarters in Tex-Tech			
	Four and Less		More than Four	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.
3	3.00	1.67	2.96	.92
4	1.36	.87	1.88	1.32
5	3.10	1.41	2.75	1.49
6	2.59	1.37	2.92	1.35
7	2.03	1.05	3.46	1.39
8	3.14	1.22	3.16	1.27
9	2.05	1.26	2.08	1.08
10	1.74	1.14	2.54	1.51
11	2.33	1.46	2.50	1.24
12	2.21	1.49	2.54	1.39
13	2.36	1.32	2.88	1.38
14	2.45	1.16	3.29	.89

Table A.6. Mean ($\bar{x}$) and Standard Deviation (S.D.) for Positions-in-Tex-Tech Variable Groups

Question	Highest Position Held in Tex-Tech			
	Operative		Management	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.
3	2.94	1.19	3.07	.90
4	1.52	.99	1.50	1.14
5	3.10	1.25	2.82	1.75
6	2.69	1.32	2.68	1.46
7	2.06	1.14	3.21	1.34
8	3.06	1.22	3.32	1.23
9	2.19	1.20	1.82	1.20
10	1.70	1.17	2.50	1.40
11	2.31	1.46	2.50	1.29
12	2.26	1.47	2.39	1.46
13	2.30	1.32	2.93	1.34
14	2.44	1.13	3.18	1.05

Table A-7. t-Test Results for Significance of Response Differences Between Personal Variable Groups*

Questions	Significance of Differences					
	Industry (0,1)	Status (2,3)	Status (2,4)	Status (3,4)	Quarters (1,2)	Positions (1,2)
3	.219	.036	.880	.010	.913	.728
4	.815	.685	.936	.525	.148	.957
5	.745	.519	.990	.525	.476	.569
6	.116	.660	.704	.409	.484	.988
7	.792	.581	.003	.051	.001	.006
8	.465	.064	.204	.001	.946	.514
9	.589	.228	.796	.243	.940	.364
10	.731	.829	.324	.254	.071	.061
11	.607	.813	.580	.330	.722	.690
12	.668	.077	.637	.015	.508	.783
13	.068	.327	.022	.172	.272	.156
14	.591	.220	.005	.137	.030	.050

Group Codes

Industry	Status	Quarters	Positions
0 - No	2. Freshmen and	1. Four and Less	1. Operatives
1 - Yes	Sophomores	2. More than Four	2. Management
	3. Juniors		
	4. Seniors		

*does not include results of graduate students

Table A-8. Factors Affecting Response Variance On Questions 3 - 14

	Factor	% of Variance
1.	Personal Position Relative to Tex-Tech	40.3
2.	Evaluation of Supervisors	21.0
3.	Evaluation of Personnel Utilization	7.7
4.	Value of Production Experience	6.9
5.	Industrial Work Experience	4.7
		80.6

Table A-9. Item Codes for Tables A-10 to A-14

Item Number

1. Yarn Production
2. Fabric Production
3. Finishing
4. Dyeing
5. Quality Control
6. Industrial Engineering
7. Product Development
8. Process Evaluation
9. Financial Planning
10. Production Scheduling
11. Long-Range Planning
12. Employee Relations
13. Accounting
14. Marketing
15. Personnel Administration
16. Others

Table A-10. Frequency Distribution of Choices to Question 15

Item	1st Place Votes	2nd Place Votes	3rd Place Votes	4th Place Votes	5th Place Votes	No Indication	Total Votes	Sum Total
1	11	8	4	1	1	20	25	102
2	2	12	9	4	3	15	30	96
3	2	1	6	3	6	27	18	44
4	0	0	1	4	0	40	5	11
5	5	1	7	7	7	18	27	71
6	1	1	1	4	4	34	11	24
7	9	3	2	1	4	26	19	69
8	0	2	0	2	2	39	6	14
9	0	0	3	0	3	39	6	12
10	1	5	4	5	3	27	18	50
11	7	3	1	2	3	29	16	57
12	4	2	3	4	4	28	17	49
13	0	0	0	0	0	45	0	0
14	0	4	0	5	1	35	10	27
15	3	3	4	3	4	28	17	49
16	0	0	0	0	0	45	0	0

Table A-11. Mean ($\bar{x}$), Standard Deviation (S.D.), and Significance of Differences Between Status-in-School Personal Variable Groups to Question 15

Item	Status in School										
	Freshmen		Sophomores		Juniors		Seniors		Graduate Students		Significance of Differences
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	
1	3.00	2.16	2.09	2.17	2.45	2.25	2.07	2.34	2.25	2.63	.954
2	3.00	.82	1.91	1.87	2.18	1.94	1.93	1.87	2.50	1.73	.838
3	1.00	1.41	.91	1.45	1.18	1.72	1.13	1.55	0	0	.721
4	.50	1.00	.18	.60	.18	.60	.33	.90	0	0	.859
5	1.75	2.22	1.73	1.68	1.82	1.60	.87	1.60	3.00	1.41	.217
6	.50	1.00	.91	1.70	.18	.60	.27	.59	1.50	1.73	.204
7	0	0	2.73	2.37	1.82	2.18	1.20	1.97	.25	.50	.092
8	0	0	.09	.30	.55	1.29	.47	1.13	0	0	.635
9	0	0	.27	.47	0	0	.60	1.24	0	0	.298
10	0	0	1.36	1.50	1.18	1.60	1.27	1.83	.75	1.50	.633
11	2.50	2.89	.82	1.83	1.09	1.97	1.47	1.92	1.00	2.00	.672
12	2.25	2.06	.73	1.55	.91	1.38	1.00	1.77	1.75	2.36	.547
13	0	0	0	0	0	0	0	0	0	0	0
14	0	0	.55	1.29	.55	1.29	.87	1.46	.50	1.00	.811
15	.50	1.00	.73	1.42	.91	1.70	1.53	1.81	1.50	2.38	.669
16	0	0	0	0	0	0	0	0	0	0	0

Table A-12. Mean ($\bar{x}$), Standard Deviation (S.D.), and Significance of Differences Between Prior-Industry-Experience Personal Variable Groups for Question 15

Item	Prior Industry Experience				
	No Prior Experience		Prior Experience		Significance of Difference
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	
1	2.11	2.12	2.50	2.36	.567
2	2.11	1.80	2.17	1.76	.919
3	.74	1.23	1.33	1.75	.188
4	.26	.76	.22	.65	.867
5	1.48	1.72	1.72	1.71	.657
6	.56	1.01	.50	1.34	.875
7	1.89	2.21	1.00	1.85	.166
8	.15	.46	.56	1.34	.150
9	.19	.62	.39	.98	.397
10	1.22	1.63	.94	1.51	.567
11	1.56	2.15	.83	1.62	.233
12	1.11	1.76	1.06	1.63	.915
13	0	0	0	0	0
14	.70	1.35	.44	1.10	.502
15	.93	1.62	1.33	1.75	.427
16	0	0	0	0	0

Table A-13. Mean ($\bar{x}$), Standard Deviation (S.D.) and Significance of Differences Between Quarters-in-Tex-Tech Personal Variable Groups to Question 15

Item	Quarters Involved in Tex-Tech				
	Four and Less		More than Four		Significance of Differences
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	
1	2.30	2.24	2.17	2.17	.857
2	2.21	1.76	1.92	1.83	.625
3	.85	1.39	1.33	1.67	.333
4	.18	.58	.42	1.00	.334
5	1.85	1.66	.83	1.64	.076
6	.61	1.27	.33	.65	.484
7	1.79	2.18	.83	1.75	.180
8	.36	1.03	.17	.58	.534
9	.09	.29	.75	1.36	.011
10	1.06	1.58	1.25	1.60	.725
11	1.03	1.85	1.92	2.23	.185
12	1.15	1.62	.92	1.93	.685
13	0	0	0	0	0
14	.61	1.27	.58	1.24	.958
15	.91	1.55	1.58	1.93	.233
16	0	0	0	0	0

Table A-14. Mean ($\bar{x}$), Standard Deviation (S.D.), and Significance of Differences Between Positions-in-Tex-Tech Personal Variable Groups to Question 15

Item	Positions in Tex-Tech				
	Operatives		Management		Significance of Differences
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	
1	2.42	2.20	1.93	2.23	.495
2	2.29	1.74	1.79	1.85	.381
3	.90	1.42	1.14	1.61	.618
4	.19	.60	.36	.93	.482
5	1.97	1.64	.71	1.54	.020
6	.65	1.31	.29	.61	.333
7	1.65	2.15	1.29	2.02	.600
8	.19	.75	.57	1.22	.208
9	.10	.30	.64	1.28	.028
10	1.10	1.60	1.14	1.56	.929
11	1.06	1.90	1.71	2.13	.311
12	1.13	1.63	1.00	1.88	.816
13	0	0	0	0	0
14	.52	1.15	.79	1.48	.509
15	.84	1.55	1.64	1.82	.135
16	0	0	0	0	0

APPENDIX B

STATISTICAL DATA FROM THE ALUMNI QUESTIONNAIRE

Table B-1. Questions Used in Tables B-3 to B-7

Question 1	Do you feel your experience in Tex-Tech aided your educational preparation in the textile processing area?
Question 2	How beneficial to your job was the product production experience you received in Tex-Tech?
Question 3	Were the problems you encountered in your dealings with the Tex-Tech realistic (as compared to actual on-job problems)?
Question 4	How well did your experience in Tex-Tech prepare you for any problems in the management of people you have faced on your job?
Question 5	How effectively did your supervisors perform the responsibilities of his/her position in relation to the operations of Tex-Tech as an organization?
Question 6	How effectively did your supervisors perform the responsibilities of his/her position in relation to the education or training of his/her subordinates?
Question 7	How closely did the organizational structure of Tex-Tech relate to the organizational structure you encountered in industry?
Question 8	How closely do you feel the business environment of Tex-Tech is related to the business environment you encountered on your job?
Question 9	How well did Tex-Tech meet the objective of exposing students to technical hands-on education in the textile processing area?
Question 10	How well did Tex-Tech meet the objective of exposing students to problems in the management of people?

Table B-2. Numbers for Personal Variable Groups

Variables	Numbers in Group	
Quarters	22	
1-3 quarters		8
4-6 quarters		8
7 and above quarters		6
Position	22	
Operative		4
Department Head		5
Vice-President		6
President		3
Not indicated		4
Graduation	22	
1973		7
1974		8
1975		7

Table B-3. Mean ($\bar{x}$) and Standard Deviation (S.D.) for Number-of-Quarters Variable Groups

Question	Number of Quarters in Tex-Tech					
	1 - 3 Quarters		4 - 6 Quarters		7 and above Quarters	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
1	2.69	1.73	3.13	1.36	3.42	2.15
2	1.88	1.38	1.29	1.70	3.25	1.89
3	2.75	1.13	2.50	1.78	3.58	1.36
4	2.38	1.33	2.93	2.07	3.67	1.25
5	2.13	1.16	3.31	.84	2.25	1.75
6	2.19	1.07	2.44	1.08	2.25	1.33
7	3.69	.59	2.29	1.66	3.67	.88
8	2.38	1.10	1.83	1.81	3.25	1.54
9	2.50	1.49	3.07	1.62	3.42	1.91
10	3.19	1.03	3.19	1.39	4.00	.95

Table B-4. Mean ($\bar{x}$) and Standard Deviation (S.D.) for Position-in-Tex-Tech Variable Groups

Question	Highest Position Held in Tex-Tech							
	Operative		Department Head		Vice President		President	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
1	1.25	1.04	3.90	.65	3.42	2.15	3.17	1.61
2	1.13	1.32	1.90	1.56	2.58	2.46	2.50	2.18
3	2.38	1.38	2.70	1.15	3.25	1.73	4.33	.58
4	1.88	.85	2.90	1.30	3.33	1.89	5.00	0
5	1.63	1.38	2.50	.61	2.75	2.04	3.33	.58
6	1.50	.58	2.70	.91	2.58	1.74	2.17	.76
7	3.25	.50	3.10	1.64	3.00	1.70	3.50	1.32
8	1.88	1.03	2.10	1.64	3.25	1.54	3.00	2.00
9	2.13	1.65	3.10	1.19	3.58	2.01	3.33	1.53
10	2.75	1.04	3.30	1.26	3.83	1.21	4.67	.58

Table B-5. Mean ($\bar{x}$) and Standard Deviation (S.D.) for Year-of-Graduation Variable Groups

Question	Year of Graduation					
	1973		1974		1975	
	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
1	3.00	1.58	2.50	1.91	3.71	1.47
2	1.64	1.41	2.25	1.73	2.33	2.32
3	3.00	3.13	1.26	1.43	2.50	1.79
4	3.14	1.44	2.81	1.53	2.83	2.11
5	2.21	2.31	1.11	1.75	3.29	.57
6	2.21	1.04	2.06	1.43	2.64	.74
7	3.50	.82	3.50	.81	2.50	1.95
8	1.86	1.38	3.13	1.33	2.30	1.79
9	2.64	1.52	2.69	1.58	3.67	1.84
10	3.79	.95	3.44	1.08	3.00	1.44

Table B-6. t-Test Results for Significance of Response Differences Between Number-of-Quarters and Year-of-Graduation Personal Variable Groups

Question	Significance of Differences					
	Quarters			Graduation		
	(1,2)	(1,3)	(2,3)	(1,2)	(1,3)	(2,3)
1	.582	.495	.761	.593	.398	.196
2	.473	.141	.074	.474	.522	.940
3	.747	.234	.249	.861	.567	.481
4	.543	.090	.463	.675	.760	.983
5	.034	.873	.152	.901	.042	.184
6	.649	.924	.776	.820	.392	.352
7	.043	.958	.095	1.000	.240	.210
8	.498	.236	.175	.093	.637	.359
9	.489	.331	.730	.957	.294	.305
10	1.000	.158	.242	.523	.252	.515

Group Codes

Quarters	Graduation
1. 1 - 3 quarters	1. 1973
2. 4 - 6 quarters	2. 1974
3. 7 and above quarters	3. 1975

Table B-7. t-Test Results for Significance of Response Differences Between Position-in-Tex-Tech Personal Variable Groups

Question	Significance of Differences					
	Highest Position Held in Tex-Tech					
	(1,2)	(1,3)	(1,4)	(2,3)	(2,4)	(3,4)
1	.002	.102	.111	.643	.384	.866
2	.454	.280	.342	.581	.662	.956
3	.710	.422	.072	.559	.066	.338
4	.217	.191	.002	.675	.035	.183
5	.239	.367	.104	.799	.106	.652
6	.056	.272	.242	.896	.430	.711
7	.866	.786	.737	.924	.734	.673
8	.819	.159	.370	.261	.511	.840
9	.336	.265	.369	.649	.816	.857
10	.505	.183	.036	.492	.133	.307

Group Codes

1. Operative
2. Department head
3. Vice-President
4. President

Table B-8. Factors Affecting Response Variance on Questions 1 - 10

	Factor	% of Variance
1.	Educational Preparation for Later Work	48.1
2.	Relativity to Real-World Problems and Situations	19.8
3.	Personal Information	10.7
4.	Preparation in Actual Work Environment	6.5
5.	Status in Tex-Tech	4.6
		89.7

APPENDIX C

STATISTICAL DATA FROM THE INDUSTRY QUESTIONNAIRE

Table C-1. Numbers for Personal Variable Groups

Variables	Numbers in Groups
Position	96
Plant Manager and Below	53
Above Plant Manager	43
Familiarity	96
No Prior Knowledge of Tex-Tech	47
Prior Knowledge of Tex-Tech	49

Table C-2. Frequency Distribution to Question One

Item	1st Place Votes	2nd Place Votes	3rd Place Votes	4th Place Votes	5th Place Votes	No Indication	Total Votes	Sum Total
1	21	15	12	4	5	32	64	233.7
2	10	19	14	7	6	35	61	201.8
3	0	2	6	6	4	76	20	44.2
4	0	0	2	2	9	81	15	21.3
5	1	8	19	13	10	43	56	134
6	3	3	9	11	7	62	34	83.5
7	5	5	5	4	6	70	26	74.5
8	3	5	3	2	4	79	17	52
9	10	7	5	6	7	61	35	112
10	2	6	4	6	5	72	24	63.5
11	3	2	9	4	3	75	21	61
12	24	7	13	11	8	33	63	217
13	0	1	3	0	5	87	9	18
14	2	5	11	5	8	64	32	83.5
15	0	1	3	5	5	82	14	28
16	2	0	0	0	2	92	4	12

Item Codes

1. Yarn Production
2. Fabric Production
3. Finishing
4. Dyeing
5. Quality Control
6. Industrial Engineering
7. Product Development
8. Process Evaluation
9. Financial Planning
10. Production Scheduling
11. Long-Range Planning
12. Employee Relations
13. Accounting
14. Marketing
15. Personnel Administration
16. Others

Table C-3. Mean ($\bar{x}$), Standard Deviation (S.D.), and Significance of Differences Between Personal Variable Groups to Question One

Item	Position					Familiarity				
	Plant Mgr. and Below		Above Plant Mgr.		Signif. of Diff.	No Prior Knowledge		Prior Knowledge		Signif. of Diff.
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		$\bar{x}$	S.D.	$\bar{x}$	S.D.	
1	2.54	2.09	2.31	1.98	.583	2.33	2.03	2.53	2.05	.639
2	2.25	1.93	1.91	1.84	.383	1.85	1.88	2.35	1.89	.197
3	.42	.93	.52	1.11	.627	.38	1.01	.54	1.01	.428
4	.19	.56	.26	.63	.544	.17	.56	.28	.62	.367
5	1.33	1.44	1.48	1.56	.635	1.56	1.51	1.23	1.47	.282
6	.86	1.29	.88	1.52	.930	1.09	1.59	.66	1.14	.137
7	.77	1.58	.78	1.42	.986	.49	1.04	1.05	1.81	.067
8	.68	1.53	.37	1.00	.260	.47	1.27	.61	1.38	.596
9	.91	1.60	1.49	1.99	.115	1.32	1.89	1.02	1.71	.419
10	.83	1.44	.45	1.18	.170	.60	1.31	.72	1.37	.639
11	.60	1.23	.67	1.46	.797	.77	1.40	.51	1.26	.349
12	2.47	1.97	2.00	2.09	.259	2.49	2.01	2.04	2.04	.281
13	.21	.63	.16	.75	.752	.11	.48	.27	.84	.259
14	.70	1.31	1.08	1.53	.189	.97	1.42	.78	1.42	.508
15	.25	.76	.35	.84	.528	.40	.95	.18	.60	.175
16	0	0	.28	1.08	.062	.02	.15	.22	1.01	.174

Item Codes

1. Yarn Production
2. Fabric Production
3. Finishing
4. Dyeing
5. Quality Control
6. Industrial Engineering
7. Product Development
8. Process Evaluation
9. Financial Planning
10. Production Scheduling
11. Long-Range Planning
12. Employee Relations
13. Accounting
14. Marketing
15. Personnel Administration
16. Others

Table C-4. Frequency Distribution to Question Two

Item	1st Place Votes	2nd Place Votes	3rd Place Votes	No Indication	Total Votes	Sum Total
1	7	11	3	73	22	46.3
2	2	1	1	90	6	9.8
3	1	3	4	86	10	13.8
4	28	15	11	42	54	125
5	14	11	6	65	31	70
6	12	20	15	49	47	91
7	2	5	2	87	9	18
8	8	5	4	79	17	38
9	12	10	24	50	46	80
10	6	12	5	73	23	47
11	2	7	15	72	24	35
12	0	0	2	94	2	2

Item Codes

1. Production of Products
2. Sale of Products
3. Marketing of Products
4. Management of People
5. Experience in Operating a Profitable Business
6. Developing Leadership Characteristics
7. Solving Unstructured Problems
8. Exposure to a Business Environment
9. Practical Experience in the Textile Processing Area
10. Dealing with Employee Morale and Motivation Problems
11. Exposure to Business Administrative Policies and Procedures
12. Others

Table C-5. Mean ($\bar{x}$), Standard Deviation (S.D.), and Significance of Differences Between Personal Variable Groups to Question Two

Item	Position					Familiarity				
	Plant Mgr. and Below		Above Plant Mgr.		Signif. of Diff.	No Prior Knowledge		Prior Knowledge		Signif. of Diff.
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		$\bar{x}$	S.D.	$\bar{x}$	S.D.	
1	.53	1.07	.43	.82	.605	.60	1.04	.37	.88	.260
2	.02	.14	.20	.70	.062	.14	.54	.07	.43	.477
3	.15	.57	.13	.40	.876	.12	.43	.17	.55	.608
4	1.43	1.25	1.14	1.36	.272	1.55	1.28	1.06	1.28	.063
5	.45	.89	1.07	1.33	.008	.47	1.00	.98	1.23	.028
6	.98	1.10	.91	1.13	.746	.91	1.12	.98	1.11	.777
7	.09	.41	.30	.80	.103	.23	.73	.14	.50	.475
8	.36	.90	.44	.96	.662	.23	.70	.55	1.08	.093
9	.92	1.16	.72	.91	.349	.81	.99	.86	1.12	.822
10	.66	1.06	.28	.73	.048	.55	1.02	.43	.87	.519
11	.38	.71	.35	.72	.847	.36	.74	.37	.70	.969
12	.02	.14	.02	.15	.883	.02	.15	.02	.14	.977

Item Codes

1. Production of Products
2. Sale of Products
3. Marketing of Products
4. Management of People
5. Experience in Operating a Profitable Business
6. Developing Leadership Characteristics
7. Solving Unstructured Problems
8. Exposure to a Business Environment
9. Practical Experience in the Textile Processing Area
10. Dealing with Employee Morale and Motivation Problems
11. Exposure to Business Administrative Policies and Procedures
12. Others

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